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May 1984

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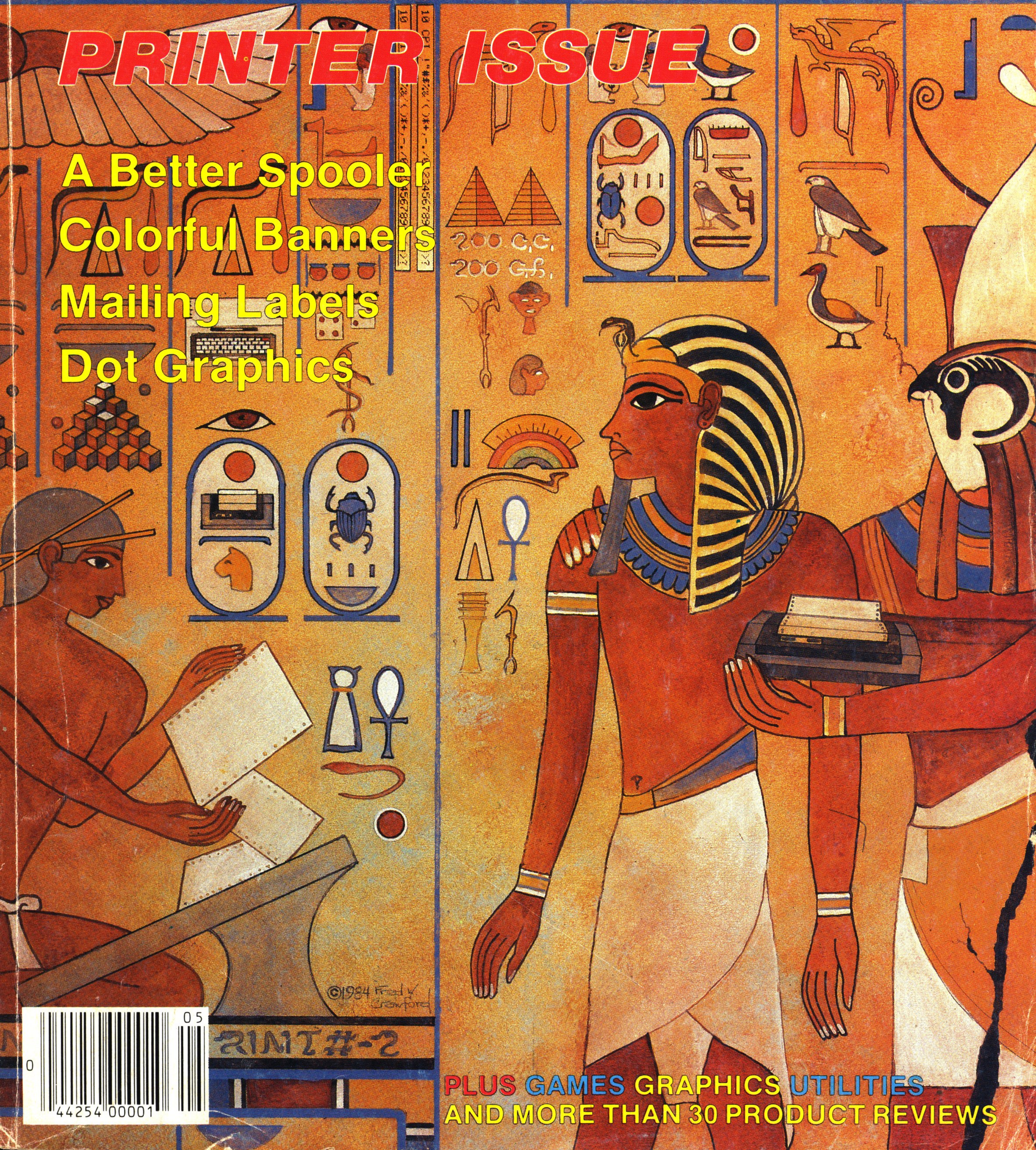
THE COLOR COMPUTER MONTHLY MAGAZINE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## PRINTER ISSUE

A Better Spooler
Colorful Banners
Mailing Labels
Dot Graphics

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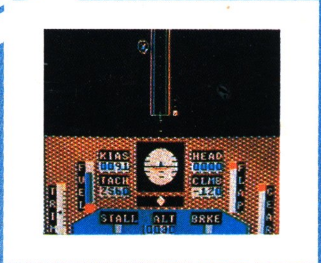
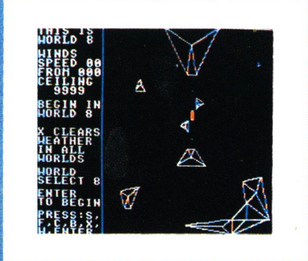
New From Tom Mix. . .

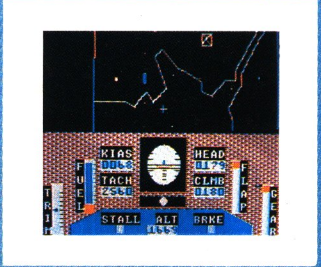
Worlds of FLIGHT

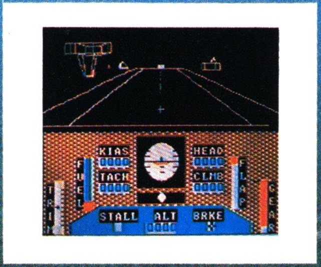
Not A Game — A Very Realistic Flight Simulation





```
THIS IS
WORLD 8
WINDS
SPEED 00
FROM 000
CEILING
 9999
BEGIN IN
WORLD 8
X CLEARS
WEATHER
IN ALL
WORLDS
WORLD
SELECT 8
ENTER
TO BEGIN
PRESS:S,
C,C,B,X,
W,ENTER
```





WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.

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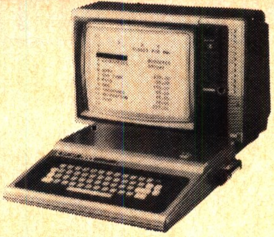

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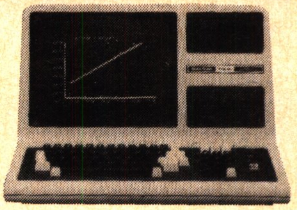

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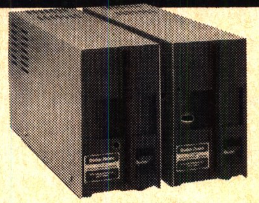

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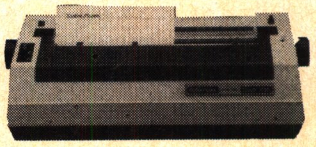

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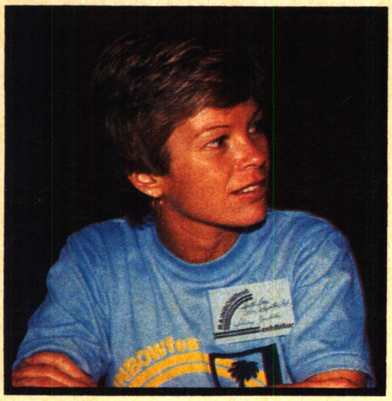
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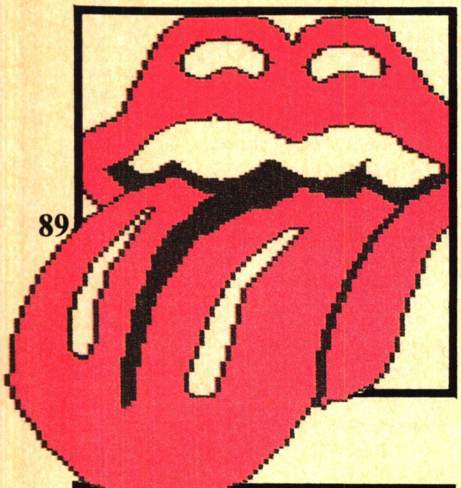
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The RAINBOW

May 1984 Vol. III No. 10

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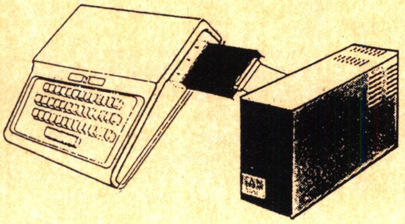

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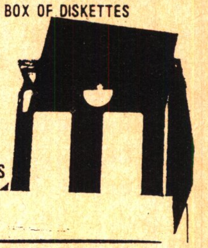

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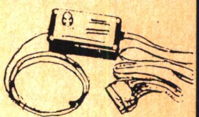

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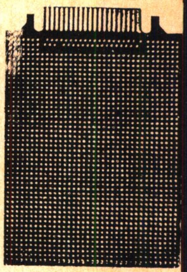

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# letters to RAINBOW

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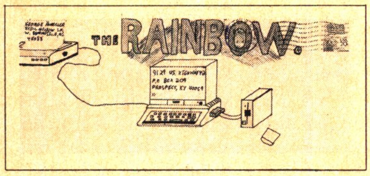


**Envelope Of The Month**

*George Mueller*
*W. Bloomfield, MI*

### A COMPUFAIR

*Editor:*

The Northern Pennsylvania Amateur Computer Club and the Hazleton Campus of Penn State University will hold their third annual Computer Fair May 19, 1984. Compufair '84 will be held on the Hazleton Campus at Penn State in Hazleton, Penn.

The fair will feature seminars, workshops, vendor displays and demonstrations by the club's user groups. For more information call (717) 454-8731.

*George Lee*
*Hazleton, PA*

### INFORMATION PLEASE

*Editor:*

I purchased a Gorilla Banana Printer for my CoCo and would like to know if anyone knows of a screen dump program I can use with it. By the way, anyone interested in buying a Banana Printer should make sure the printer is sent with a serial interface unless you have a parallel/serial converter. The Banana is a fine printer but if you don't specify a serial interface when ordering you may be disappointed when it arrives and end up spending at least $60 for an interface cable, like me. Write: 16718 Polo Road, 61081.

*Marty A. Mapson*
*Sterling, IL*

*Editor:*

I have some questions about the machine language listings in your Rainbow On Tapes.

How do you load the listing so that it can be displayed on the screen? How do you make changes to the listing? How can you print out the listing to a printer?

I have *EDTASM+* from Radio Shack.

*Les Dunni*
*Milton, FL*

**Editor's Note:**
**You must use a disassembler such as the one available in *ZBUG*.**

### AUTOSTART ACTION

*Editor:*

Is there a way to make a program *RUN* automatically once it is loaded from tape?

*Harry A. Thayer*
*Ravena, NY*

**Editor's Note:**
**See Steve Abrams' letter.**

*Editor:*

I would like you or your readers help! I would like to know how to autostart Extended BASIC or machine language programs loaded from tape or disk.

There is so much information and helpful tips in your publication that I thought you or your readers might solve this problem for me?

*Richard A. Thomas*
*Ferndale, WA*

**Editor's Note:**
**See the following letter.**

*Editor:*

Recently there have been a rash of new programs on disk which when *LOADMed*, perform their own start without having to type in *EXEC*. Also some of these programs start again at the beginning when the RESET button is pushed.

How can this be accomplished before the program even starts?

*Steve Abrams*
*San Francisco, CA*

**Editor's Note:**
**By loading a small program into low memory you can force a program to autostart by modifying certain memory locations. You can also force a program to restart upon [RESET] by the same method. See *the Rainbow* "Memory Map" and see if you can identify these addresses. You may start at $9F.**

*Editor:*

I am a recent proud owner of a CoCo 2 Extended BASIC computer. At the time of purchase your magazine was recommended to me. I have a copy of the January 1984 issue and it is better than I had anticipated.

One of the things I wanted to do with my new CoCo is to place on tape 7½ generations of my family tree with all the data about each generation. At present I have about 90 to 96 direct ancestors and others to record.

I am having problems finding a program for genealogy. Would you know of any program that would handle this much information and where I could obtain it?

*LaVerne Ashabranner*
*Jeffersonville, Ind.*

**Editor's Note:**
**See *All in the Family Tree*, February 1984, Page 78. Also West Bay Company has a genealogy program called *Roots*.**

### SOME DO'S AND DON'TS

*Editor:*

I am 13 and have a 64K CoCo. I enjoy your magazine a lot and especially enjoy "Letters to Rainbow." I'm in a computer club at school and recently several computers have broken down. They have blamed this on the peeks and pokes of our programs. So, we have three angry teachers and some poor kids who are being punished for it. I told them that it was impossible for the program to hurt the computer. (So I live dangerously.) But being that I'm a kid, I guess they started telling me how wrong I was.

I have read a statement somewhere about software hurting hardware but can't find that particular issue to prove my story is true. Who's right?

Can I use peeks and pokes safely from now on without worrying about hurting the computer?

*Dylan Krider*
*Houston, TX*

**Editor's Note:**
**Dylan, the computer will *not* be damaged by any command you type in or by any program you run, even if there are errors. One thing that *will* wreck a CoCo is plugging or unplugging cartridges or disk controllers (anything that goes into the cartridge slot) with the CoCo turned on. *Always* switch the CoCo off before changing cartridges.**

*Editor:*

I have a 1.0 "D" board, upgraded to 32K. I recently bought a Radio Shack DWP-210. To get it to work, I needed to install a new Color Basic 1.1 chip, #8040364 A. It takes about 10 minutes to pop out the original and put in the new chip.

Does anyone know how to get the DWP-210 to underline using the *Telewriter* word processor?

Write me: Route 2, Box 577A, 56367.

*Eugene J. Beniek*
*Rice, MN*

### LOST AND FOUND

*Editor:*

Over the past couple of years, I've gained quite a large stockpile of information about CoCo products — more information than I can afford to take advantage of. I'm on the mailing lists of several large CoCo software companies, so I have a lot of new product information coming in at regular intervals. I'd like to extend an invitation to *Rainbow* readers, especially those who may be new to the CoCo Community. If anyone is looking for a certain type of program and they've had no success finding it so far, they can write me at 1801 17th Avenue, 49858. I'll try to answer any letters as quickly as possible. I feel that CoCo is a great machine and there are a lot of great products available — hopefully I can help people find some of them.

*Dale Dobson*
*Menominee, MI*

### GAMES, GAMES, GAMES

*Editor:*

I recently typed in an Adventure game from the February 1984 issue *The Amazing Adventures of Karrak*. I cannot get past the pit and I don't know what goes in the slot on the first game. If anyone knows the solution to my problem, please send it to me: 11 Walnut Dr., 06248.

*Mark McConnell*
*Hebron, CT*

*Editor:*

I'm only 11 but I think your magazine is great!

If someone in CoCoLand has some answers to *El Diablero*, I would appreciate it. Please send all clues and solutions to me at: Box 473, P0J 1E0.

*Marc Brisson*
*Earlton, Ontario*

*Editor:*

I need answers to the Adventures *Raaka-Tu* and *Pyramid*. Please help!

If anybody has the answers to the above questions, write me at P.O. Box 555, 78040.

*Fred Turner*
*Laredo, TX*

### OH, MUMMY

*Editor:*

For all of you Adventure buffs who are still having trouble in *Pyramid* and *Raaka-Tu*, I have a few major tips for you. In *Pyramid*, no one can seem to find the Pharoah's chest. It is deep within the maze, past the pit. This information has been printed before, yet the person always would leave out one vital piece of information. When you get to the pit in the maze, go east one more time, and then go northwest, then you should see the words "Dead End." This is where the chest is. In order to get it, the mummy has to have previously taken some of your treasures. If he has, you will see your treasures, and the chest. If you do not know how to get the mummy to take your treasures, or you cannot get to the pit, write me, and I will tell you.

In *Raaka-Tu*, when you leave the temple, you only have 25 points, yet you have all of the treasures. To solve this, when you leave the temple, go west twice, and then north three times, then press "Score," and you have 50 points. If you can't find any of the treasures, or just need to find one more, just write me at: 110 Ashley Drive, 29631.

*John Allen*
*Clemson, SC*

*Editor:*

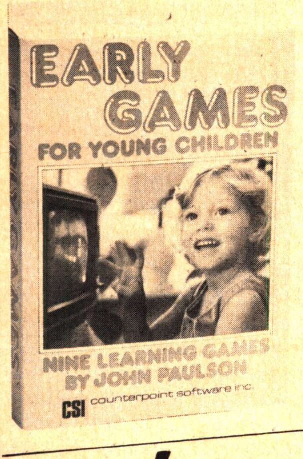
I have reached the 220 points for *Pyramid* which was quite a challenge. I can see why some people are running into a lot of problems. Any questions you have, I would be glad to answer, 1058 E. 9th Avenue, 85204.

*Judy Fodness*
*Mesa, AZ*

*Editor:*

I have helpful hints to solving *Bedlam*. I have answers to questions such as: How do you get the red key? How do you get the green key? How do you stop wandering? How do you get out? If you need any help on *Bedlam*, send a self-addressed stamped envelope to: 1450 Picadilly Street, 23513. One dollar handling appreciated. I will also include a map of *Bedlam*.

*Harry L. Perkins, III*
*Norfolk, VA*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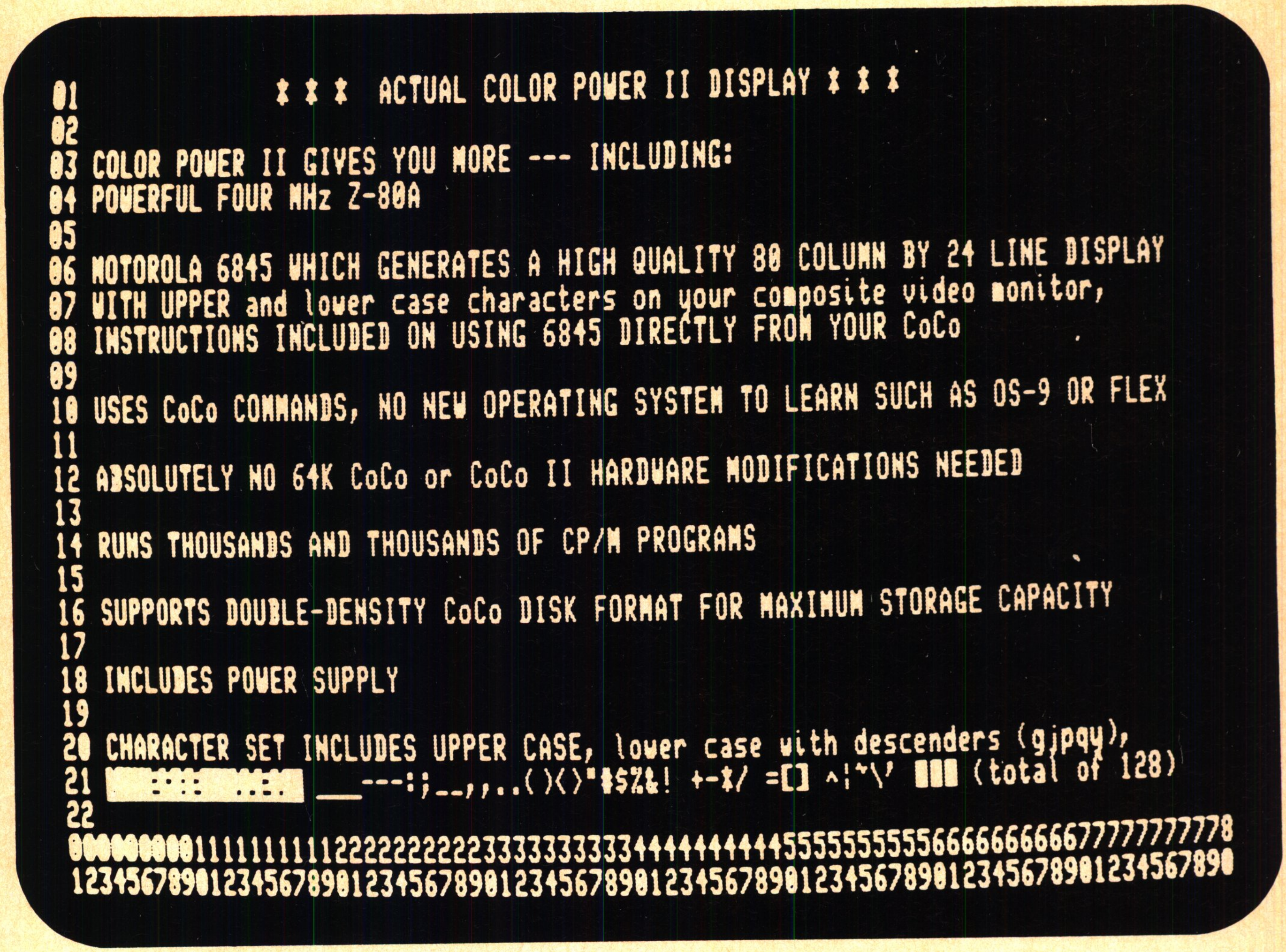

```
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02
03 COLOR POWER II GIVES YOU MORE --- INCLUDING:
04 POWERFUL FOUR MHz Z-80A
05
06 MOTOROLA 6845 WHICH GENERATES A HIGH QUALITY 80 COLUMN BY 24 LINE DISPLAY
07 WITH UPPER and lower case characters on your composite video monitor,
08 INSTRUCTIONS INCLUDED ON USING 6845 DIRECTLY FROM YOUR CoCo
09
10 USES CoCo COMMANDS, NO NEW OPERATING SYSTEM TO LEARN SUCH AS OS-9 OR FLEX
11
12 ABSOLUTELY NO 64K CoCo or CoCo II HARDWARE MODIFICATIONS NEEDED
13
14 RUNS THOUSANDS AND THOUSANDS OF CP/M PROGRAMS
15
16 SUPPORTS DOUBLE-DENSITY CoCo DISK FORMAT FOR MAXIMUM STORAGE CAPACITY
17
18 INCLUDES POWER SUPPLY
19
20 CHARACTER SET INCLUDES UPPER CASE, lower case with descenders (gjpqy),
21 ██████████████ ___---:;__,,..()<>"#$%&! +-*/ =[] ^¦~\' ███ (total of 128)
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## TWO FOR THE TICKLE

*Editor:*

Have you heard these two?

Wife of Computer Enthusiast: "Why did the computer see a chiropractor?"

Computer Enthusiast: "I don't know. Why?"

Wife: "Because it had a slipped disk."

. . . . . .

Computer Enthusiast: "Why did the computer see the dentist?"

Son: "I don't know, Dad. Why?"

Computer Enthusiast: "To straighten out its byte."

*Mrs. A.E. Fuller*
*Montrose, CO*

**Editor: Why does Mrs. Fuller write computer jokes?**
**Computer Enthusiast: Don't ASCII! I haven't array of an idea. We ought to delimiter to BASIC statements.**

---

## KUDOS

*Editor:*

Add my name to the list of people around the reading area in saying, "Thanks, for a great magazine!" You and your staff have convinced my friends and me that the Color Computer is not only the best computer, but also the one with the best information source, *the Rainbow*!

We are growing by the years with software and hardware additions and are looking forward to growing with your magazine in knowledge and understanding of this fascinating world of computers!

May life be one BIG *Rainbow* for us all!

*John H. Boehnlein*
*South Bend, IN*

*Editor:*

I really enjoy your magazine. I have compared the three major magazines available for the CoCo and yours is tops.

I would like to point out that I've had no problems obtaining these programs, but I consider your magazine of such high quality and low price that I feel obligated to "pay " for the convenience of having the programs sent to my door. I hope others (pirates) will recognize the true value of this service and aid you in being able to continue providing such quality to the CoCo Community at such a great price. All those programs plus a great magazine complete with documentation. Your efforts are appreciated!

*Gerald A. Mills*
*Topeka, KS*

*Editor:*

I would like to compliment you on a fine magazine. In fact, my subscription to one of your competitors is being replaced with a subscription to *Rainbow* this year. It was a pleasant surprise to find so much support available for the CoCo after purchasing what was going to be "just something to play with."

Again, thanks for an excellent magazine and all the help it has given me.

*David B. Lamon*
*Yuba City, CA*

*Editor:*

I would like to thank you for an outstanding magazine. To me, this is the *only* magazine for the CoCo. Thanks!

Keep up the great work and thanks for a great magazine. The CoCo deserves it!

*Jeff D. Sauer*
*Perkiomenville, PA*

## HINTS AND TIPS

*Editor:*

I am writing this letter to you because I want to praise this fine publication that you have. This is the second year that I have subscribed to your excellent magazine. I also want to say that I like this fine computer that I am writing this letter on. The TRS-80 Color Computer is a machine that is not as well praised as it should be. The 6809 microprocessor is a very powerful little beast that should not be underestimated. My system consists of a 64K Color Computer and a disk drive. I have a lot of excitement for the future of this computer since OS-9 was released by Radio Shack. It shows that Radio Shack cares a lot for the future of the Color Computer. Since I bought the computer back in 1982 I have seen it expand and grow to a very well-supported computer. Even Radio Shack has begun to expand its support for its little computer.

I would like to share a couple of peeks and pokes I have discovered.

| Decimal Location | Description |
|---|---|
| 25 & 26 | Beginning of BASIC program |
| 27 & 28 | End of BASIC program |
| 39 & 40 | Top of cleared space |
| 113 | Warm start flag (If 85 Then warm start) |
| 116 | Top of RAM |
| 157 & 158 | Jump address for *EXEC* command |

*Dale Robertson*
*Rush Lake, Saskatchewan*

*Editor:*

We have encountered a situation you might want to pass along to your readers. At least two brands of wireless telephones will cause the Amdek disk drives to speed up and crash. If you have portable phones in your house you might want to avoid their use when your Amdek drive is being used. Evidently the R.F. signal being generated by the phones can affect the speed of the drives.

*Norman R. Shelton*
*Owls Nest Software*

*Editor:*

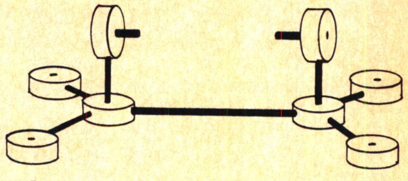
With the 64K question so frequently discussed, I would like to share a short program that will let 32K users know if they have "half good" or "full" 64K chips.

```
20 FOR X = 16000 TO 16013
30 READ Y:POKEX,Y: NEXT X
40 DEF USRO = 16000
50 A = USRO (0)
60 IF A THEN PRINT "32K" ELSE
PRINT "64K"
70 END
80 DATA 198, 191, 247, 255, 2, 246,
255, 34, 196, 4, 79, 126, 180, 244 RUN
```

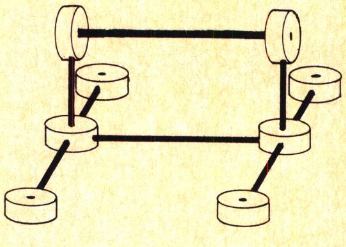
*Bruce Sumner*
*Windsor, OH*

*Editor:*

To make a stand for holding roll paper for the printer, we used Tinkertoys.



Long roll — sits on top of printer



For heavier rolls, sits on floor

*Juli Koch*
*Margaret Hettinger*
*Lebanon Junction, KY*

## INTERESTING INDEX

*Editor:*

May I make a suggestion to your readers?

Tape an index card on each issue of *the Rainbow* and write on it the tips, hints, ideas, and articles of interest to you and note the page numbers as well. As your collection grows, it will be vastly valuable and easy to find any item you wish to recall. But be smart — if you read an article about a disk drive or for a printer and you think it would be great, except you don't have a disk drive or a printer, note it anyway. Someday you will, and you'll wonder where (what month and year) was that article about banner headlines or "Gosh, wasn't there a *POKE* to prevent headcrashes?"

*Larry Arnold Lansberry*
*Phoenix, AZ*

*Editor:*

How would you like a disk file to appear on the directory, but nobody except you can load it? To do this, save your file as follows: *SAVE "FILE"+CHR$(143)*. The file will appear normally on the directory, but attempts to LOAD "FILE" will give you a ?NE ERROR. To load the file, use *LOAD "FILE" +CHR$(143)*. I'm sure you can find variations on this process.

*Craig M. Arnold*
*Dallas, TX*

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NEW

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Baud Rates: 110-4800 (communicate)
600-9600 (printer).
Screen Format: 80 x 25 w/true upper & lower case.
Select half, full duplex or echo.
Select odd, even, mark, space or no parity.
Send all 128 characters from keyboard.
Select 7 or 8 bit words.
Select 1 or 2 stop bits.
Send a true line break.
Select all caps if needed.
Automatic capture of incoming files.
X on/X off capabilities.
Merge text or programs in buffer.
53,000 character buffer (64K).
Split buffer option (64**K**).
10 macro keys.
Four buffer send modes (dump, prompted, manual & time delay).
Buffer size indicators (bytes used & bytes remaining).
Buffer editor w/auto key repeat.
Scroll forward & reverse to view buffer & print viewed screen option.
Selectable printer formats (line feeds, etc.).
Selectable trapping of incoming characters.
Print while receiving data*.
Spool received data while receiving more (64K).
Buffer editor has these features:
Move forward and reverse through buffer. Insert, type over, delete lines or characters.
Block deletion or start to end of buffer delete.
Save and load macros.
Save and load parameters.
Use 1-4 disk drive (w/SAVE, LOAD, DIR. & granule display).
Easy to use MENU driven format.
Comprehensive users manual.
Works with **ALL** Radio Shack™ Disk Systems and **all** models of color computers.

Still not convinced? How about a 15 day, money back guarantee? If you don't like the package for any reason, we will refund your money upon return of a like-new package.† Who out there is offering you this kind of deal? And customer support was never better. Simply fill out your registration card and send it back to us and you will be notified when new features, improvements, etc. become available because all registered owners will receive **Free** upgrades for a $5.00 shipping and handling fee).

As with all good Professional programs, ***Ultra* Term +** is **all machine code.** This program has been tested by those both familiar and unfamiliar with communications programs. And when you call for some technical support, you **won't** get an answering machine during our business hours (10-5 CST M-Sat.) under normal circumstances. Technical help is usually available all day.

Note: Color Term + PLUS + should have all of the same capabilities described above by the time you read this ad, but call first to make sure. ***Ultra* Term +** is ready to ship **now.**

**PRICE: *Ultra* Term +** — $55.95 (Disk/Tape)
**Color Term + Plus + (V5.0)** $45.95 (Disk/Tape)
**Word·Pak** (Includes a software driver so you can use your basic programs with no modification in most cases!)...**$139.95** + $3.00 S&H
**Y-Cable**...**$29.95** (Required if expansion port not used with disk drives)

Complete Package ***Ultra* Term +**, Word·Pak & Y Cable [subtract $20.00 if not needed] is only **$210.00**

****Ultra* Term** + supports the 80 column board made by PBJ, Inc. If you already have the board, simply order the program, but those of you who don't can get a good deal.

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- Full screen edit allows delete, insert & change.
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- Manual includes program operation flowcharts.
- Not needed, but included is user modification section.
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*Editor:*

I would like to pass on this information to the people who have been having problems with their computers shutting off on them.

The current sensing resistor R66 in the "D" board .33 OHM should be replaced with a high quality resistor. This particular type of resistor has the leads crimped to the resistive wire and is prone to open. I was experiencing problems with my computer quitting. Turning it off and on would sometimes correct it for a while. After I replaced it with a weld-bonded type of resistor all my problems went away.

*Dean Broadbent*
*Howell, MI*

---

### BOUQUETS AND BRICKBATS

*Editor:*

I want to say some kind words about a few of your advertisers. In December I ordered from both Computer Plus and MichTron. All I can say is that if every advertiser conducts business like them, there are some mighty satisfied CoCo users out here. Likewise, for a non-mail order company, The Program Store in Eatontown, N.J. is outstanding. The managers are super nice and gladly let customers try the programs before buying. Even though I normally pay full list for what I buy and have to drive 65 miles to get there, I've saved myself that "ripped-off" feeling many times by trying before buying. If all the Program Stores operate this way they're well worth the visit.

Thanks again for an excellent magazine.

*Gene Gillam*
*Bayonne, NJ*

*Editor:*

I have recently purchased *Complete Personal Accountant* software by Futurehouse on the recommendation of *Rainbow* and I am reasonably happy with the product even though the cost is quite high compared to other similar utilities.

The reason for writing this letter is to point out to others, that to receive any software support for this product you must send in an additional $20. In fact, if you call the company they will speak to you if you give them your VISA number.

I personally have not tried to call them but their literature states that it is so.

This $20 fee is supposed to cover any future updates or additions to the product which is purported to be sent free of charge.

I doubt that a company that charges for software support is about to send an update free from any further charges.

I would be interested in hearing of any other experiences with this company.

*Lawrence B. Snyder*
*Norristown, PA*

*Editor:*

We would like to address our policy of charging $20 for technical phone support to the end users of our *Complete Personal Accountant*. First, it is important to note that not everyone who buys a home finance package needs technical support. As a matter of fact, less that 25 percent of our customers inquire about our program. Keeping this in mind, we thought it would be unfair to incorporate the cost of technical support in the price of the package. Our technical support staff are all full-time, paid employees who do nothing but customer support work all day. There are *many* companies which charge for their technical support programs.

If we were to include the cost of technical support into the price of the *CPA*, the package would cost $99.95! Instead, we thought it would be much more fair to charge $79.95 and let the end user decide if he or she wanted to pay for technical support.

*John K. Watkin*
*Futurehouse*

---

### JURIS CORRESPONDENCE

*Editor:*

I use my computer primarily in support of my law practice and find that the programs I locate with your assistance are very useful. I also correspond occasionally with Mr. Robert P. Wilkens, an attorney in Lexington, S.C. Mr. Wilkens is the president of R.P.W. Publishing, Inc., which publishes *The Lawyer's Microcomputer*, a journal dedicated to the use of Radio Shack computers and related equipment in the practice of law. You may reach Mr. Wilkens at P.O. Box 1046, Lexington, S.C., 29072. The telephone number is (803) 359-9941.

I would also like to put in a good word for John Boals, president of PCLEAR 80, 494 Cline Avenue, Mansfield, Ohio, 44907. John has been most helpful in gathering and investigating, not to mention marketing, business applications for the CoCo. I have found his advice to be most helpful.

I am interested in corresponding with other attorneys who are using the CoCo in the practice of law. My CompuServe ID number is 71615,1511; although I rarely use it except for research (mainly security data). My address is 732 South Court St., 44256.

*James N. Brown III*
*Medina, OH*

### A FIRST CLASS TACKLER

*Editor:*

I enjoy your great magazine and was glad to hear that it is now sent second class mail. I was afraid sometimes that our mail personnel found it so dynamite that they were not going to give it up.

It would be really great if electronics stores would start to advertise in your magazine. I'm in a Computer Club and we are presently making our own modems. Some of the parts are not carried by Radio Shack and are hard to get. Also, some of the hardware projects in your magazine, like the "Cheapstick" (Feb. 1984, Page 186), are great too, and would be even greater if finding all the right parts was not so difficult.

After the "Letters to *Rainbow*" built up my confidence, I upgraded my CoCo to 64K. Between building the modem and "Cheapstick," a woman like myself, with two left feet, is now ready to tackle the world. If only I can find all the parts!

*Willa Stokes*
*Philadelphia, PA*

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### BULLETIN BOARD SYSTEMS

*Editor:*

I am very pleased to announce the beginning of an all new Canadian Bulletin Board Service based in Port Mouton, Nova Scotia. The system fully supports up- and downloading, E-Mail, on-line games, and many other features. The Great White North BBS is on-line 24 hours a day, seven days a week. There is no charge to use this BBS and all callers are welcome, (902) 683-2086.

*Jeff Pyne, SYSOP*
*Port Mouton, Nova Scotia*

*Editor:*

We are a software and hardware company mainly supporting the CoCo. We are closely associated with the Color America Users Group in Southern California, but are not a specific entity of that group. For efficiency and expansion of services available to C.A. U.G., E.D.C., we started a new BBS called the Musashi Network. The number is: (213) 258-0640.

*Felix P. Edwards*
*Los Angeles, CA*

*Editor:*

Elkins Institute in Dallas, Inc. would like you to know about our new Bulletin Board, called CAREERS, that is now on-line 24 hours a day in Dallas, Texas. This is a Color Computer BBS, but all others are welcome.

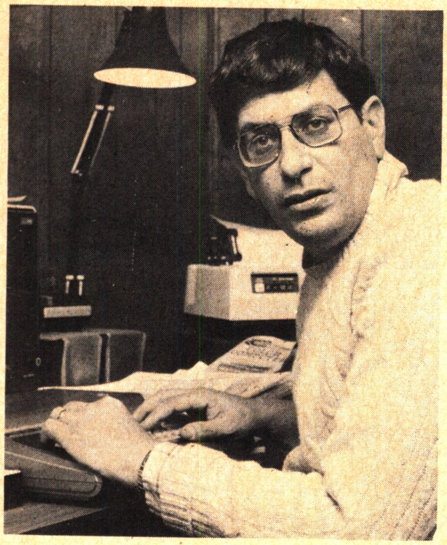
In addition to the electronic mail section, we also have a bulletins section that covers various aspects of current career training. The merchandise section is very well provided for by RAM Electronics. Comments and suggestions would be welcome on the BBS, and we hope to hear from your readers soon. The CAREERS BBS number is (214) 692-0513.

*John Novocilsky Jr.*
*Dallas, TX*

**LETTERS TO THE EDITOR are always welcome. Please keep them short if possible and we will try to answer some of the questions in this column. Others may be left open for solutions by other users. In order to make space for as many letters as possible, we reserve the right to edit submissions.**

**Letters can be sent to *the RAINBOW*, P.O. Box 209, Prospect, KY 40059.**

# PRINT #-2,



Thanks to the installation of some new equipment at our printer's, last month's issue of *the Rainbow* was a little later than usual. That was good and bad.

The good part was that I was able to fill the first couple of paragraphs of this space with some news from RAINBOWfest-Long Beach; something I would not have been able to do had the printer handled *the Rainbow* on time as is usually the case.

The bad part of it all is that we were a tad late with last month's issue and this one arrives a couple of days less than the full month between issues. What happened? We can all sympathize with our printer: They bought a new piece of computer equipment that would make things "lots easier" for them — but there were a few interfacing problems.

How many times have we all heard that one? Oh well, the problems seem to have been licked as of this writing and we are back on schedule again.

And, yes, you did get a chance to read a little bit about Long Beach last month, but this month I get the opportunity to tell you even more about the show. It was really a great one! I think everyone, just about, had a fine time and the spirit of CoCo Community was very much in evidence.

My special thanks to Bob Albrecht, who was our keynote speaker at the CoCo Community Breakfast Saturday morning. And what a surprise — it was also Bob's birthday. How did I find out? Well, Don Inman told me. Bob was trying to keep it a deep secret. That didn't last long, either. Nor did the special cheesecake (for the big cheese) we had whipped up for Bob at the last minute.

I think the greatest thing about RAINBOWfest is that it is a lot of fun for all. By the time you read this, our RAINBOWfest-New Brunswick will be history, too, and if you have not been to one of our shows, there's only one chance left — the Chicago show June 22-24 at the Hyatt-Regency Woodfield. That was the site of CoCo's Very First Show a year ago. So, do plan to join us then if you have not been with us already. Or, as we say here in the South, "Do come again!"

By the way, the question I get asked most often at RAINBOWfests is whether we will be back next year. Although at this writing the dates are not 100 percent firm, we do plan to do another series of RAINBOWfests in the 1984-85 "season."

Tentative plans call for a show in the Eastern part of the United States in the fall; a show in California during the winter and a return to Chicago in the spring — somewhat earlier than this year's Chicago show. There will be details (we hope) about sites and dates next month.

One of the things I like the most about RAINBOWfest is the opportunity to talk at some length with other members of the CoCo Community who attend each show. Long Beach was no exception; and one of the questions I was asked is one I would like to share with you for your input.

The issue was arcade-type games and the subject was whether I believed "winning" was an important issue that might be lacking from these games. Here's the thesis:

With most traditional games (board games, card games, simulation games and the like, whether written for a computer or not) the player has an opportunity to win the game. With most arcade games this is not the case — all you can do is lose.

Think about it for a minute. You can play a game for hours and hours, mount up scores that are higher and higher (as our "Scoreboard" feature will attest), but, in the end, you always "lose" — you are always destroyed by the game.

The discussion I had in Long Beach centered around the fact that it might be better that the player should, at some point, be able to "win" the game — that the game would, at some point, say "I lose and you win."

My point was that this would certainly decrease the playability of a game. Once the player won, all the challenge would be gone. The response was that there could be levels of play — as there are now — and that once someone won at a certain level, he or she could go on to the next one.

Some of you might consider this to be a fairly trivial issue, but the more I think about it, the more significant it becomes. Do we want our children (and ourselves, who play these games, too) to always be "losers," no matter how proficient we become? Should we encourage "winning"? Is it that important to be able to win all the time — or at least, have the chance to win? Or possibly, do we teach more about life by encouraging our youngsters (and ourselves) to always strive for something better,

*(continued on Page 285)*

# Telewriter-64™
## the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
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- **No hardware modifications required**

### THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

> *...one of the best programs for the Color Computer I have seen...*
> — Color Computer News, Jan. 1982

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But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

### 64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

### 64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

### RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

### FEATURES & SPECIFICATIONS:

**Printing and formatting:** Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminet, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

RAINBOW
CERTIFICATION
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**File and I/O Features:** ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

**Editing features:** Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

> *...truly a state of the art word processor... outstanding in every respect.*
> — The RAINBOW, Jan. 1982

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Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add $2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

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A fantastic new Hi-res strategic arcade game with animated movement! As a soldier/monkey of fortune, you have been commissioned by the king to save the forest from its enemies. Fulfill the assignment and be knighted a monkey of the round table.
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# BUILDING MAY'S RAINBOW

## Our Printer Issue . . .
## Heading For New Brunswick Edition . . .
## Plus, A CoCo Rock Festival . . .

In his review of Jarb Software's "talking" *Spell-A-Tron* this month, Bruce Rothermel hit a responsive chord with me. In explaining that many words need to be spelled phonetically in order to sound right when the Votrax voice synthesizer "speaks" them, he wonders if the same word will be spelled variously according to the region of the country the program user lives in. That observation brought back memories.

As sometimes happens when you live in a very small town, my third grade teacher was also my mother. On occasion, she was also the spelling bee judge as well as enunciator. One particular time, now indelibly etched in my memory, all that stood between me and victory was the final word. She pronounced it twice as I strained to listen: "whey-air," she said, "whey-air." My heart pounded; I had never, ever heard of this word.

Valiantly, I gave it a shot, "Whey-air," I said, "W-H-A-I-R." "Wrong," she said, "Whey-air is spelled W-H-E-R-E." What? Where?? I was robbed, I thought. "But Mom, why didn't you just say 'whurr,' " I protested — for weeks on end. If only she had said "whurr," I'd have aced out the little girl with the long blond hair and won the spelling bee and lived happily ever after. As it was, for years, *I thought* I was right and she was wrong and held a secret grudge against my third grade teacher — my own mother, yet — for "doing me in."

Thanks to the advent of microprocessor technology, now every parent can blame it on the computer if Johnny can't spell. Actually, I like the "analog dimension," the shades of gray, that phonetic spelling brings to the otherwise "either/or" digital device we call a Color Computer; it adds a personal touch to our CoCo that it can not only "talk" but do so with a regional accent.

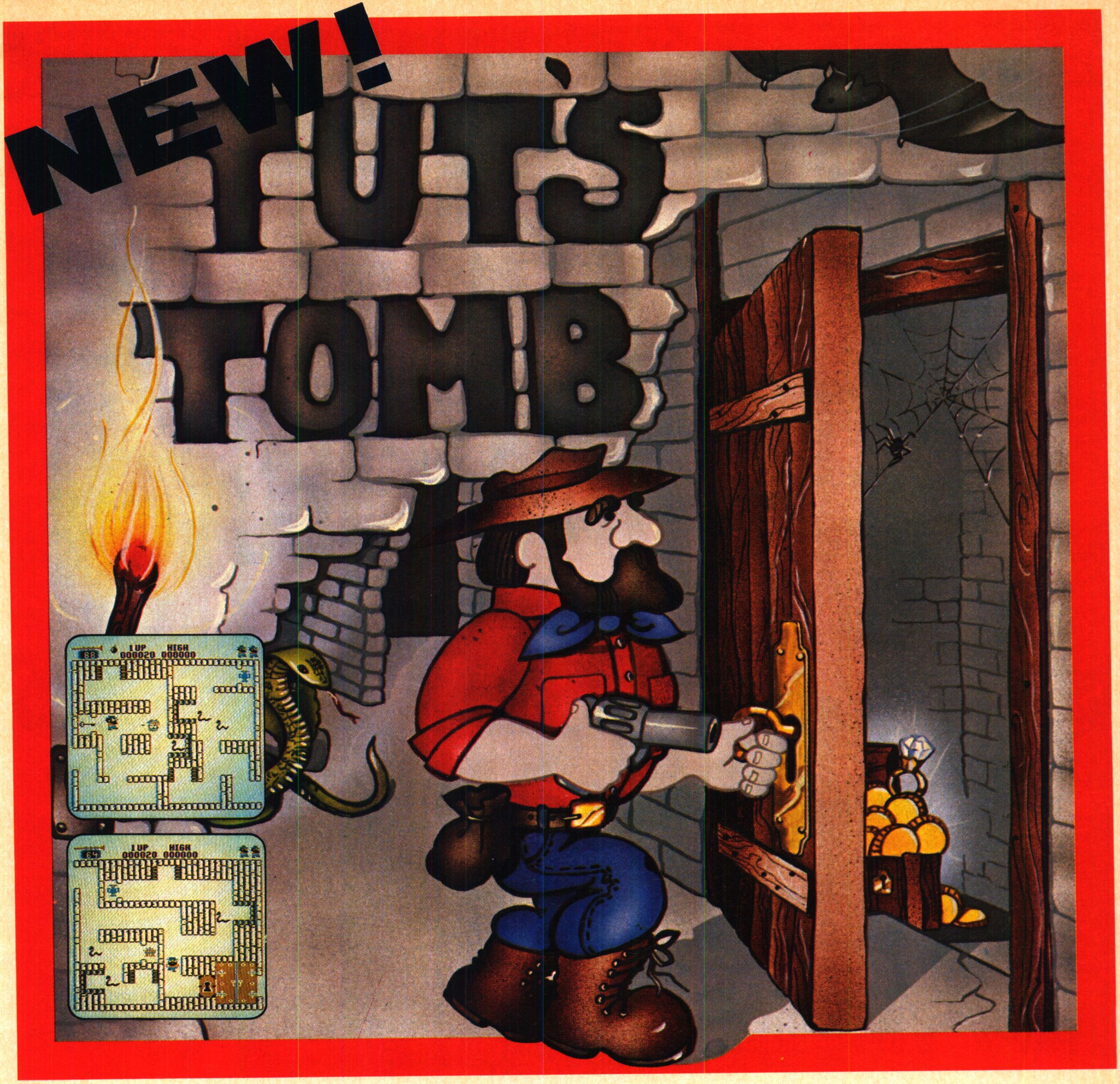
But this is our printer issue isn't it? And the impact of computer printers is definitely toward standardization of the printed word. Right? Only at first glance. On closer examination, with printers as well, the premium is on personalization. The ultimate printer, it would seem, would be one that writes illuminated script with a quill pen, albeit at 9600 Baud. While the technology is here for scanners to "read" an entire printed page at a glance, the rush is to make one's own printer as distinctive and different as computerly possible. *Rainbow* can help.

In this printer issue, we have everything from a "postcard whacker" to a banner program for the Color Graphics Printer 220. Dennis Weide delves into "Printer Magic" while Mike Himowitz provides another "Printer Mystery." Damon Swanson makes our good spooler even better and Tom Szlucha provides not only a graphics screen dump, but also a label-making program for the little CGP-115. Dot matrix printer owners, don't despair, Charles M. Thonen has a mailing label program for you, too.

Fred Scerbo has a printer's delight pumping out of our "Wishing Well" this month with his "CoCo Rock Festival" and coloring book programs. Tom Nelson digresses from his legal advice to provide counsel on selecting a printer and Mike Fahy shows us how to create Old English, Italics and Futuristic typefaces on the L.P. VII or DMP-100 in his tutorial on dot graphics.

Our "CoCo Clubs" quarterly roundup of user groups appears in this issue, and that's all the transition I need to issue my monthly invitation to you to join the growing club of *Rainbow* readers. For $28, you get about 15 pounds of *Rainbow* club materials in the form of a 340-plus page monthly magazine and we share our vast library with you by printing a couple of dozen program listings in every issue for you to key in and use. As clearly as I can say it, without spelling it out aloud, we hope you'll consider a "sub-skrip-shun."

**— Jim Reed**



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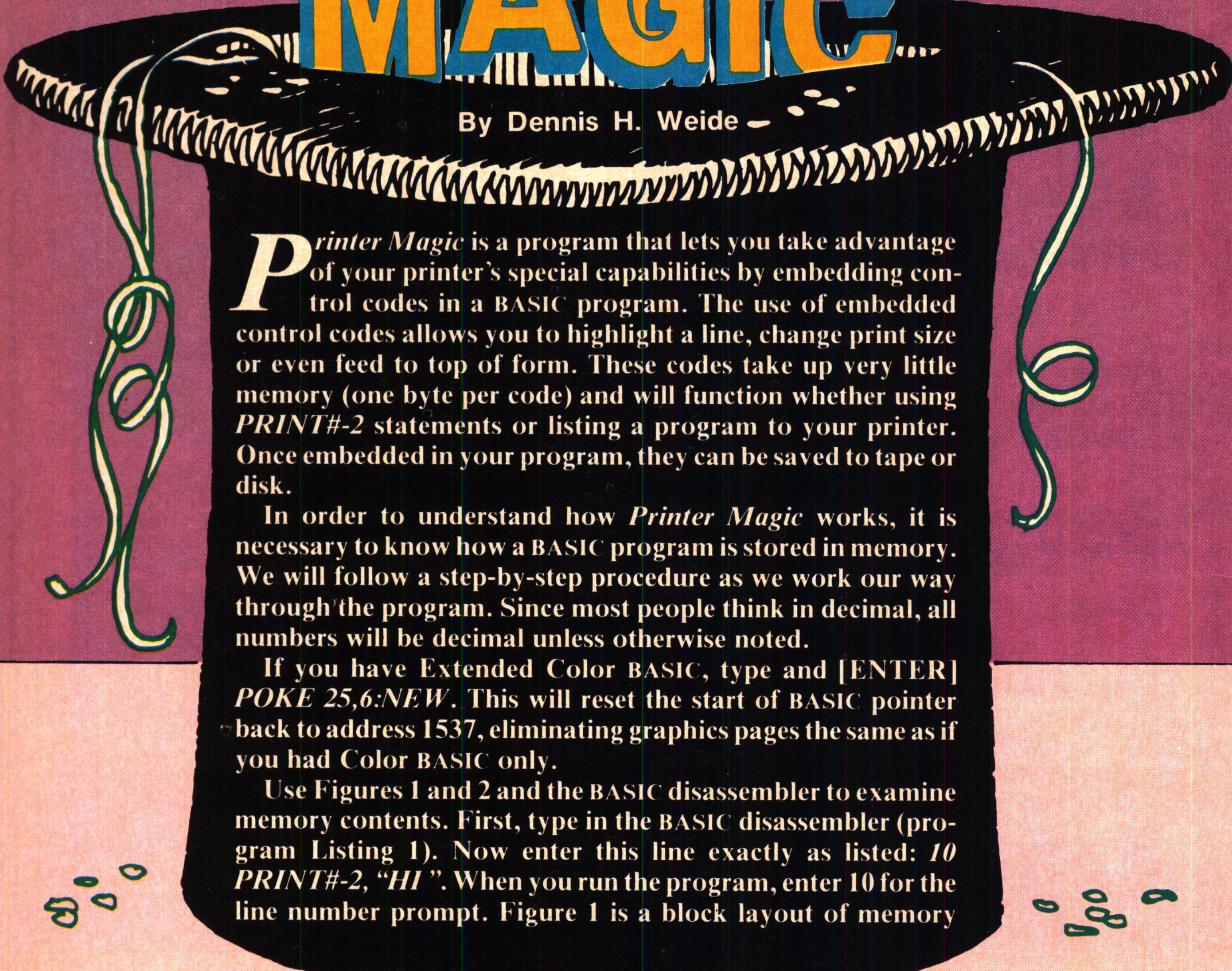
# A LITTLE PRINTER MAGIC



### By Dennis H. Weide

*Printer Magic* is a program that lets you take advantage of your printer's special capabilities by embedding control codes in a BASIC program. The use of embedded control codes allows you to highlight a line, change print size or even feed to top of form. These codes take up very little memory (one byte per code) and will function whether using *PRINT#-2* statements or listing a program to your printer. Once embedded in your program, they can be saved to tape or disk.

In order to understand how *Printer Magic* works, it is necessary to know how a BASIC program is stored in memory. We will follow a step-by-step procedure as we work our way through the program. Since most people think in decimal, all numbers will be decimal unless otherwise noted.

If you have Extended Color BASIC, type and [ENTER] *POKE 25,6:NEW*. This will reset the start of BASIC pointer back to address 1537, eliminating graphics pages the same as if you had Color BASIC only.

Use Figures 1 and 2 and the BASIC disassembler to examine memory contents. First, type in the BASIC disassembler (program Listing 1). Now enter this line exactly as listed: *10 PRINT#-2, "HI"*. When you run the program, enter 10 for the line number prompt. Figure 1 is a block layout of memory

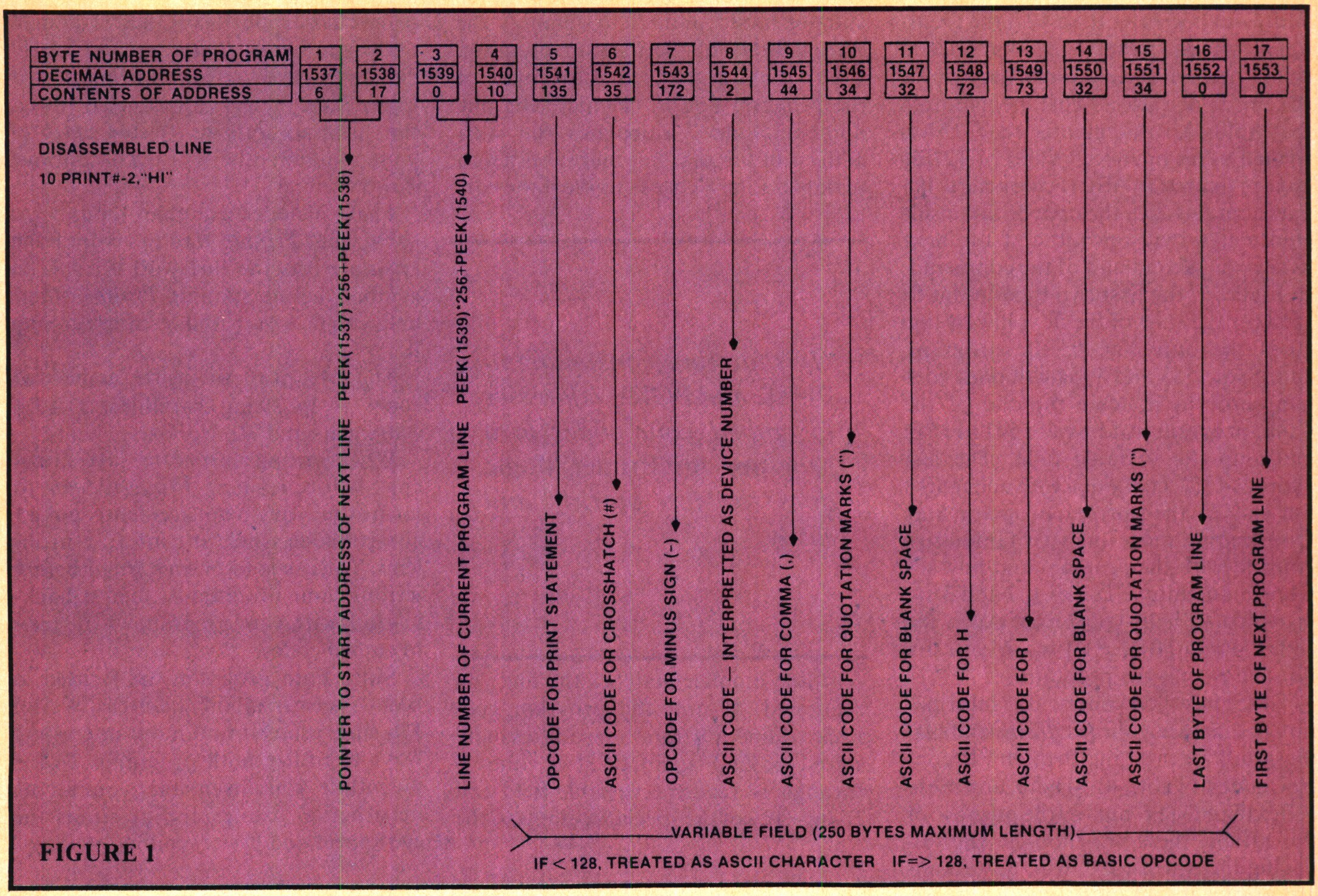

BYTE NUMBER OF PROGRAM
DECIMAL ADDRESS
CONTENTS OF ADDRESS
1 1537 6
2 1538 17
3 1539 0
4 1540 10
5 1541 135
6 1542 35
7 1543 172
8 1544 2
9 1545 44
10 1546 34
11 1547 32
12 1548 72
13 1549 73
14 1550 32
15 1551 34
16 1552 0
17 1553 0
DISASSEMBLED LINE
10 PRINT#-2,"HI"
POINTER TO START ADDRESS OF NEXT LINE PEEK(1537)*256+PEEK(1538)
LINE NUMBER OF CURRENT PROGRAM LINE PEEK(1539)*256+PEEK(1540)
OPCODE FOR PRINT STATEMENT
ASCII CODE FOR CROSSHATCH (#)
OPCODE FOR MINUS SIGN (-)
ASCII CODE — INTERPRETTED AS DEVICE NUMBER
ASCII CODE FOR COMMA (,)
ASCII CODE FOR QUOTATION MARKS (")
ASCII CODE FOR BLANK SPACE
ASCII CODE FOR H
ASCII CODE FOR I
ASCII CODE FOR BLANK SPACE
ASCII CODE FOR QUOTATION MARKS (")
LAST BYTE OF PROGRAM LINE
FIRST BYTE OF NEXT PROGRAM LINE
VARIABLE FIELD (250 BYTES MAXIMUM LENGTH)
IF < 128, TREATED AS ASCII CHARACTER IF=> 128, TREATED AS BASIC OPCODE

**FIGURE 1**

locations and their contents. Figure 2 represents a printout of the disassembled line. In Figure 2, the program line number is printed followed by the start address of this line and the next line.

---

*(Dennis Weide is a communications technician with a large telecommunications company. He teaches* BASIC *in the evenings and writes articles and programs in his spare time.)*

Beneath this, each memory location has its contents displayed as a number or character. Memory values from 33 to 127 are printed as ASCII characters. All other values are printed as decimal numbers. This allows you to recognize characters easily.

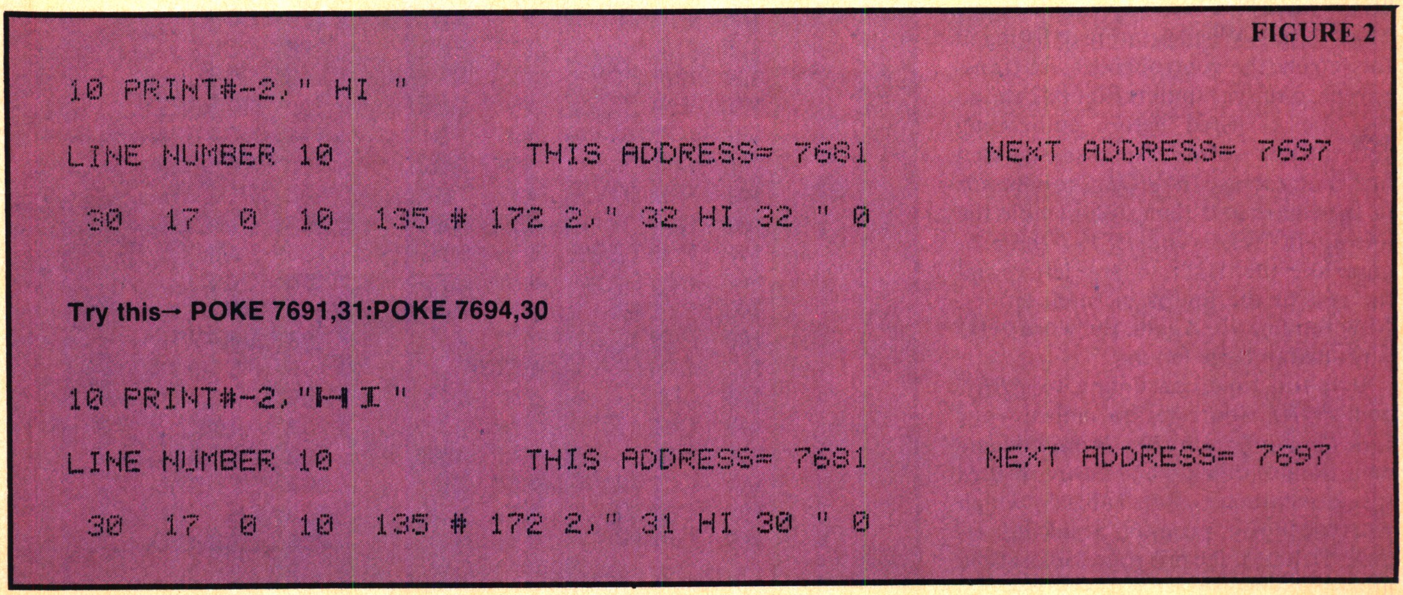
To find the first address of a BASIC program, look at the start of BASIC pointer (addresses 25 and 26). Use the following command to compute the start address:

PRINT PEEK(25)*256+PEEK(26).

The first two bytes of a BASIC program line point to the start address of the next program line. The next two bytes contain the current line number. Figure 1 shows how to compute start address and line number.

The fifth byte is the start of the variable field. If the contents of any of these

**FIGURE 2**



```
10 PRINT#-2," HI "

LINE NUMBER 10             THIS ADDRESS= 7681          NEXT ADDRESS= 7697

 30  17  0  10  135 # 172 2," 32 HI 32 " 0
```

**Try this→ POKE 7691,31:POKE 7694,30**

```
10 PRINT#-2,"HI"

LINE NUMBER 10             THIS ADDRESS= 7681          NEXT ADDRESS= 7697

 30  17  0  10  135 # 172 2," 31 HI 30 " 0
```

addresses is greater than 127, the BASIC interpreter will treat it as a BASIC opcode or mathematical function. Throughout the entire variable field, any address that holds a value greater than 127 is treated as an opcode. Values of 127 or less are treated as ASCII characters. If a byte contains 255, the opcode is considered a two-byte opcode and the next byte is the second half of the command. In Figure 1, the first two bytes point to 1553 for the start of the next line. If line 10 is the only line in the program, addresses 1553 and 1554 will both contain zeros to indicate the end of the BASIC program. Addresses 1541 to 1552 make up the variable field. The last address, 1552, contains a zero and marks the end of the current program line. Disassemble more lines to familiarize yourself with the program and how it's stored in memory. Tables 1, 2 and 3 are provided to help you break down the codes. Press [BREAK] when you are finished to exit the program.

To see how you can use this information to enhance your programs and listings, look at the Line Printer VII control codes (Table 4). There are more codes than listed, but for the purpose of this article, these are enough. The following ideas will work with any standard printer if you substitute the proper control codes for the ones listed.

Back in Figure 1, address 1547 stores a value of 32. Since this is a character code (ASCII), it will print a blank space when sent to the printer. If you *POKE* a value of 31 into that address, the printer will be set to large font when this line is listed to the printer. If you *POKE* address 1550, which also stores a 32, to ASCII code 30, the printer will be reset to small font at the end of the line. When you run or list the program to the printer, the word "HI" will be printed in large block letters. When printing or listing to the screen, the control codes are transparent to the computer. Figure 2 shows the line as listed before embedding codes, then shows the disassembled line. You can use the *POKE* commands in the figure and then disassemble the line again. When you *LLIST* the program line, the "HI" is in large letters and the rest of the line is in small letters. Now run line 10. Again, the word "HI" is printed in large letters.

It is too time consuming to *PEEK* and *POKE* addresses to embed your codes in a program. But *Printer Magic* does the job quickly and easily. It uses special characters (see Table 5) which you type in your program. Look at Listing 2. In line 5, the program looks at the start of BASIC pointer to compute the start address of your BASIC program. Line 6 looks at the second two bytes of the program line to calculate the line number. Line 7 calculates the start address of the next line and saves it as a variable. Line 8 checks to see if the current line number matches the one you requested. If not, the program goes back to line 6 with a new address and starts looking again. If it is, lines 9 through 14 read the variable field and change any of the special symbols to the proper control codes. Lines 15 and 16 allow another line selection and line 17 checks to see if your last line number is lower than the previous one. If lower, the program returns to the start of BASIC pointer; otherwise it will continue down the line.

> *"It is too time consuming to* PEEK *and* POKE *addresses to embed your codes in a program. But* Printer Magic *does the job quickly and easily."*

I have included examples 1, 2 and 3 to show what *Printer Magic* can do. Each example lists the line with the special symbols before running *Printer Magic* and with the control codes after running it.

The best way to utilize embedded codes is in string variables, *DATA* statements and *REMark* statements.

When writing a program, save a final copy before running *Printer Magic* to insure that you do not accidently poke a control code where it can cause problems. You can load *Printer Magic* before writing your program or load it back-to-back with your program when ready to embed codes.

Since both programs are written in BASIC, you can modify them easily. And I'm sure you can find more interesting ways to utilize both programs. In the meantime, you can enhance your favorite program listings and printouts for eye appeal and easier reading.

**TABLE 1**
**BASIC OPCODES**

| CODE | KEY WORD | CODE | KEY WORD | CODE | KEY WORD |
|---|---|---|---|---|---|
| 128 | FOR | 154 | CLOSE | 180 | < |
| 129 | GO | 155 | LLIST | 181 | DEL |
| 130 | REM | 156 | SET | 182 | EDIT |
| 131 | ' | 157 | RESET | 183 | TRON |
| 132 | ELSE | 158 | CLS | 184 | TROFF |
| 133 | IF | 159 | MOTOR | 185 | DEF |
| 134 | DATA | 160 | SOUND | 186 | LET |
| 135 | PRINT | 161 | AUDIO | 187 | LINE |
| 136 | ON | 162 | EXEC | 188 | PCLS |
| 137 | INPUT | 163 | SKIPF | 189 | PSET |
| 138 | END | 164 | TAB( | 190 | PRESET |
| 139 | NEXT | 165 | TO | 191 | SCREEN |
| 140 | DIM | 166 | SUB | 192 | PCLEAR |
| 141 | READ | 167 | THEN | 193 | COLOR |
| 142 | RUN | 168 | NOT | 194 | CIRCLE |
| 143 | RESTORE | 169 | STEP | 195 | PAINT |
| 144 | RETURN | 170 | OFF | 196 | GET |
| 145 | STOP | 171 | + | 197 | PUT |
| 146 | POKE | 172 | - | 198 | DRAW |
| 147 | CONT | 173 | * | 199 | PCOPY |
| 148 | LIST | 174 | / | 200 | PMODE |
| 149 | CLEAR | 175 | ^ | 201 | PLAY |
| 150 | NEW | 176 | AND | 202 | DLOAD |
| 151 | CLOAD | 177 | OR | 203 | RENUM |
| 152 | CSAVE | 178 | > | 204 | FN |
| 153 | OPEN | 179 | = | 205 | USING |

## TABLE 2
## TWO BYTE BASIC OPCODES

| CODES | KEYWORD | CODES | KEYWORD |
|---|---|---|---|
| 255 + 128 | SGN | 255 + 145 | POINT |
| 255 + 129 | INT | 255 + 146 | INKEY$ |
| 255 + 130 | ABS | 255 + 147 | MEM |
| 255 + 131 | USR | 255 + 148 | ATN |
| 255 + 132 | RND | 255 + 149 | COS |
| 255 + 133 | SIN | 255 + 150 | TAN |
| 255 + 134 | PEEK | 255 + 151 | EXP |
| 255 + 135 | LEN | 255 + 152 | FIX |
| 255 + 136 | STR$ | 255 + 153 | LOG |
| 255 + 137 | VAL | 255 + 154 | POS |
| 255 + 138 | ASC | 255 + 155 | SQR |
| 255 + 139 | CHR$ | 255 + 156 | HEX$ |
| 255 + 140 | EOF | 255 + 157 | VARPTR |
| 255 + 141 | JOYSTK | 255 + 158 | INSTR |
| 255 + 142 | LEFT$ | 255 + 159 | TIMER |
| 255 + 143 | RIGHT$ | 255 + 160 | PPOINT |
| 255 + 144 | MID$ | 255 + 161 | STRING$ |

## TABLE 3
## ASCII CHARACTER CODES

| ASCII CODE | SYMBOL | ASCII CODE | SYMBOL | ASCII CODE | SYMBOL |
|---|---|---|---|---|---|
| 32 | SPACE | 64 | @ | 96 | \ |
| 33 | ! | 65 | A | 97 | a |
| 34 | ” | 66 | B | 98 | b |
| 35 | # | 67 | C | 99 | c |
| 36 | $ | 68 | D | 100 | d |
| 37 | % | 69 | E | 101 | e |
| 38 | & | 70 | F | 102 | f |
| 39 | ’ | 71 | G | 103 | g |
| 40 | ( | 72 | H | 104 | h |
| 41 | ) | 73 | I | 105 | i |
| 42 | * | 74 | J | 106 | j |
| 43 | + | 75 | K | 107 | k |
| 44 | ’ | 76 | L | 108 | l |
| 45 | – | 77 | M | 109 | m |
| 46 | . | 78 | N | 110 | n |
| 47 | / | 79 | O | 111 | o |
| 48 | 0 | 80 | P | 112 | p |
| 49 | 1 | 81 | Q | 113 | q |
| 50 | 2 | 82 | R | 114 | r |
| 51 | 3 | 83 | S | 115 | s |
| 52 | 4 | 84 | T | 116 | t |
| 53 | 5 | 85 | U | 117 | u |
| 54 | 6 | 86 | V | 118 | v |
| 55 | 7 | 87 | W | 119 | w |
| 56 | 8 | 88 | X | 120 | x |
| 57 | 9 | 89 | Y | 121 | y |
| 58 | : | 90 | Z | 122 | z |
| 59 | ; | 91 | [ | 123 | \| |
| 60 | < | 92 | \ | 124 | ¦ |
| 61 | = | 93 | ] | 125 | \| |
| 62 | > | 94 | ^ | 126 | ~ |
| 63 | ? | 95 | _ | 127 | |

## TABLE 4
## CONTROL CODES FOR LPVII

| FUNCTION | CODE (ASCII) |
|---|---|
| LINE FEED/CARRIAGE RETURN | 10 |
| CARRIAGE RETURN ONLY | 26 |
| LARGE FONT | 31 |
| SMALL FONT | 30 |

## TABLE 5
## SYMBOLS USED FOR PRINTER MAGIC PROGRAM

| MEMORY VALUE | SYMBOL | NAME | CODE (CHR$) | CONTROL FUNCTION |
|---|---|---|---|---|
| 91 | [ | LEFT BRACKET | 31 | SET LARGE FONT |
| 93 | ] | RIGHT BRACKET | 30 | SET SMALL FONT |
| 94 | ↑ | UP ARROW | 10 | LF/CR |
| 95 | ← | LEFT ARROW | 26 | LF W/O CR |

### SAMPLES 1, 2 & 3

**Example #1 Large Font**

**Before Embedding Codes**

```
100 REM [EXAMPLE #1]
```

**After Embedding Codes**

```
100 REM EXAMPLE  #1
```

**Example #2 Line Feed With Highlight**

**Before Embedding Codes**

```
100 REM ^^EXAMPLE #2_EXAMPLE #2_EXAMPLE #2
```

**After Embedding Codes**

```
100 REM

EXAMPLE #2
```

**Example #3 Large Font Highlighted**

**Before Embedding Codes**

```
100 REM ^^[EXAMPLE #3_EXAMPLE #3_EXAMPLE #3]^
```

**After Embedding Codes**

```
100 REM

EXAMPLE  #3
```

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Listing 1:

```
20 '        BASIC DISASSEMBLER
21 '        BY DENNIS H. WEIDE
22 '        COPYRIGHT (C) 1983
23 POKE 153,24
24 CLS:INPUT"ENTER LINE NUMBER";
LN
25 PRINT#-2,"LINE NUMBER";LN,
26 ADDRESS=PEEK(25)*256+PEEK(26)
27 NUMBER=PEEK(ADDRESS+2)*256+PE
EK(ADDRESS+3)
28 NADDRESS=PEEK(ADDRESS)*256+PE
EK(ADDRESS+1)
29 IF LN=NUMBER THEN 30 ELSE ADD
RESS=NADDRESS:GOTO 27
30 PRINT#-2,"THIS ADDRESS="ADDRE
SS,
31 PRINT#-2,"NEXT ADDRESS="NADDR
ESS
32 PRINT#-2
33 FOR X=ADDRESS TO ADDRESS+3
34 PRINT#-2,PEEK(X);:NEXT X
35 FOR X=ADDRESS+4 TO NADDRESS-1
36 IF PEEK(X)>127 OR PEEK(X)<33
THEN PRINT#-2,PEEK(X); ELSE PRIN
T#-2,CHR$(PEEK(X));
37 NEXT X
38 PRINT#-2,STRING$(3,10)
39 PN=LN
40 INPUT"ENTER LINE NUMBER";LN
41 PRINT#-2,"LINE NUMBER";LN,
42 IF LN<PN THEN 26 ELSE 27
```

Listing 2:

```
1 '       PRINTER MAGIC
2 '       BY DENNIS H. WEIDE
3 '       COPYRIGHT 1983
4 CLS:INPUT"ENTER LINE NUMBER";L
N
5 ADDRESS=PEEK(25)*256+PEEK(26)
6 NUMBER=PEEK(ADDRESS+2)*256+PEE
K(ADDRESS+3)
7 NADDRESS=PEEK(ADDRESS)*256+PEE
K(ADDRESS+1)
8 IF LN=NUMBER THEN 9 ELSE ADDRE
SS=NADDRESS:GOTO 6
9 FOR X=ADDRESS+5 TO NADDRESS-2
10 IF PEEK(X)=91 THEN POKE X,31
11 IF PEEK(X)=93 THEN POKE X,30
12 IF PEEK(X)=94 THEN POKE X,10
13 IF PEEK(X)=95 THEN POKE X,26
14 NEXT X
15 ADDRESS=NADDRESS:PL=LN
16 INPUT"ENTER LINE NUMBER";LN
17 IF LN=<PL THEN 5 ELSE 6
```

**PRINTER UTILITY** 64K

# Make The Good *Spooler* Better

By Damon Swanson

Steve Good's *Spooler* (*the Rainbow*, June '83) is an excellent example of using the Color Computer in a multitasking mode. This means that your CoCo can do two jobs at one time. (We'll be hearing a lot more about that as people start using the OS-9 operating system.) There were, however, two things that limited the program for my use. First, it stole graphic memory, and second, it would not work with Radio Shack's *Screen Print* program.

With a working 64K system, it is a simple matter to move the spool buffer from graphic memory to the 32K of hidden RAM and in the process create a buffer large enough for almost any need. The first program provides a patch to Mr. Good's spooler to do just that.

The modification of Radio Shack's *SCRPRT* routine to work with the Good *Spooler* and provide full compatibility with the disk operating system is a little more complex. The second part of this article shows how to append *SCRPRT* to the *Spooler* and patch it for full disk operations.

### 32K Spooler

If you have a good 64K CoCo, you can easily modify the Good *Spooler* to use the 32K of RAM not accessed by BASIC as the print buffer. Load Good's source listing in your assembler then make the following changes referenced to its current line numbers.

First, change the origin from screen memory to the top of BASIC RAM:

```
00020     ORG     $7F65
```

This means, of course, that you must reserve memory for the program by a *CLEAR &H7F65* before *RUNning* the program. Change the end of buffer previously in low RAM to the top of the 32K RAM page:

```
00200     LDX     #$FEFF
```

Also change the beginning of buffer to the start of the upper RAM page:

```
00220     LDX     #$8000
00790     LDX     #$8000
```

I have made buffer references absolute so that the driver can be relocated anywhere in low memory.

Now we are ready to add the code that switches from the ROM (Type 0) to the RAM (Type 1) memory map before each load or store to the buffer and to switch back afterward. Do this by adding lines:

```
00405     CLR     $FFDF
00415     CLR     $FFDE
00745     CLR     $FFDF
00755     CLR     $FFDE
```

Finally, delete line 00880 (we don't need this reference anymore) and *Sooper Spooler* is ready to assemble.

You now have a print buffer considerably larger than the memory available for BASIC programs, and a direct way to use that extra memory. Since our new buffer is located nicely out of graphic space, one thing we might use it for is to speed up the Screen Print routine.

### Compatible Screen Print

Before we can use *Spooler* with Radio Shack's *SCRPRT* program there are two problems to solve. *SCRPRT* must be relocated and then patched so that it uses BASIC 1.1's regular 8-bit print driver. Otherwise, its print routine will not communicate with *Spooler*. *SCRPRT* is one of the worst examples of 6809 code I've ever seen. It is completely position dependent and almost defies relocation.

Fortunately, Tom Goodrick came to the rescue with a program to do this relocation.

Tom's trick uses the fact that the Hex values 3D, 3E and 3F, representing the most significant byte of every absolute address in the *SCRPRT* program, appear nowhere in the

*(Damon Swanson manages 130 engineers and technicians in the engineering test department of a major high-tech company. His computer hobby keeps him from meddling in the work of his staff, which includes programming M6809 and M6800 microprocessors to solve special measurement and test problems.)*

program except as absolute addresses. As a result, we can simply run through the listing with a short BASIC program that adds $40 offset each time it encounters one of the offending Hex values.

The BASIC program of Listing 1 uses Mr. Goodrick's scheme in a different and simpler program. Enter the BASIC program, then put the *SCRPRT* tape in the recorder. Press [PLAY] and run the program. When the [OK] prompt appears, *CSAVEM* to tape or *SAVEM* on disk using *&H7D80,&H7FFF,&H7D80* as the *START, END* and *EXECUTE* parameters. Our *Spooler* patch will correct some other deficiencies.

Modify the revised *Spooler* source to locate it in front of the screen print routine overwriting *SCRPRT's* initialization which is no longer used.

```
00020     ORG     $7CF4
```

Add to *Spooler's* initialization section the lines from *SCRPRT's* code that sets up to look for and respond to the up arrow:

```
00261     LDX     #$7D98
00262     STX     $16B
00263     LDA     #$7F
00264     STA     $16A
```

Delete line 00710. This line changes a carriage return to a line feed, but the RS Line Printer VII and DMP-100s require a distinction for the two passes required to print a full screen of graphics.

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See Page 145

- a lot of software for a little silver

Delete the *END* statement in line 00890, then add the source of Listing 2 to your assembly. Note that this code changes the command key from the up arrow to the down arrow as suggested by Goodrick to free the up arrow for normal line editing.

Assemble this code. From BASIC, *CLEAR 200,&H7CF4. CLOADM* or *LOADM* the relocated *SCRPRT* followed by the patched *Spooler*. Then type *EXEC*. Draw something on the graphic screen, then hit the [SHIFT] and [↓] to try it out. The machine returns to your use a few seconds after the [↓] command for a screen dump that normally takes several minutes to print.

Before turning off the computer, *CSAVEM* or *SAVEM* your patched program using *&H7CF4,&H7FFF* and *&H7CF4* as the *START, END* and *EXECUTE* parameters.

With these programs and the substantial 32K buffer, you may never need to wait on your slow printer again.

**Listing 1:**

BASIC program to relocate Radio Shack's *SCRPRT* program to reside at the top of a 32K memory.

```
10 'RELOCATE SCRPRT TO TOP OF 32
K
20 CLEAR 200,&H7D80
30 CLOADM"SCRPRT",&H4000:' RELOC
ATE TO &H7D80
40 FOR I=&H7D80 TO &H7FAE
50 V=PEEK(I)
60 IF V>&H3C AND V<&H40 THEN POK
E I,V+&H40
70 NEXT I
80 END
```

**Listing 2:**

An *EDTASM+* patch for Radio Shack's *Screen Print* program allowing it to be used with Steve Good's *Spooler*.

```
                  00880 ***************************
                  00890 *PATCH FOR RELOCATED SCPRT TO USE BASIC 1.1 DRIVER
                  00900 *BY D. SWANSON 3 AUG. 1983
                  00910 ***************************
                  00920
                  00930 * CHANGE CHARACTER INPUT TO DISK REFERENCE (LEAVE OUT
                  00950 *THESE LINES IF YOU HAVE NO DISK)
                  00960
7D9C              00970         ORG     $7D9C
7D9C 7E   C58F    00980         JMP     $C58F
                  00990
                  01000 * CHANGE KEY-SCAN TO CLEAR BUFFER FLAG
                  01010
7DA1              01020         ORG     $7DA1
7DA1 BD   A179    01030         JSR     $A179
                  01040
                  01050 * CHANGE CONTROL KEY TO DOWN ARROW (PER GOODRICK)
                  01060
7DA4              01070         ORG     $7DA4
7DA4 81   5B      01080         CMPA    #$5B
                  01090
                  01100 * CHANGE PRINT OUT TO 1.1'S 8-BIT DRIVER
7F6A              01110         ORG     $7F6A
7F6A C6   FE      01120         LDB     #$FE
7F6C D7   6F      01130         STB     $6F
7F6E 6E   9F A002 01140         JMP     [$A002]
          7CF4    01150         END     ENTRY
```

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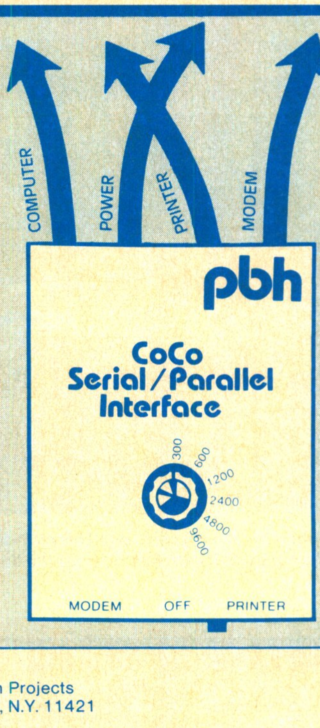

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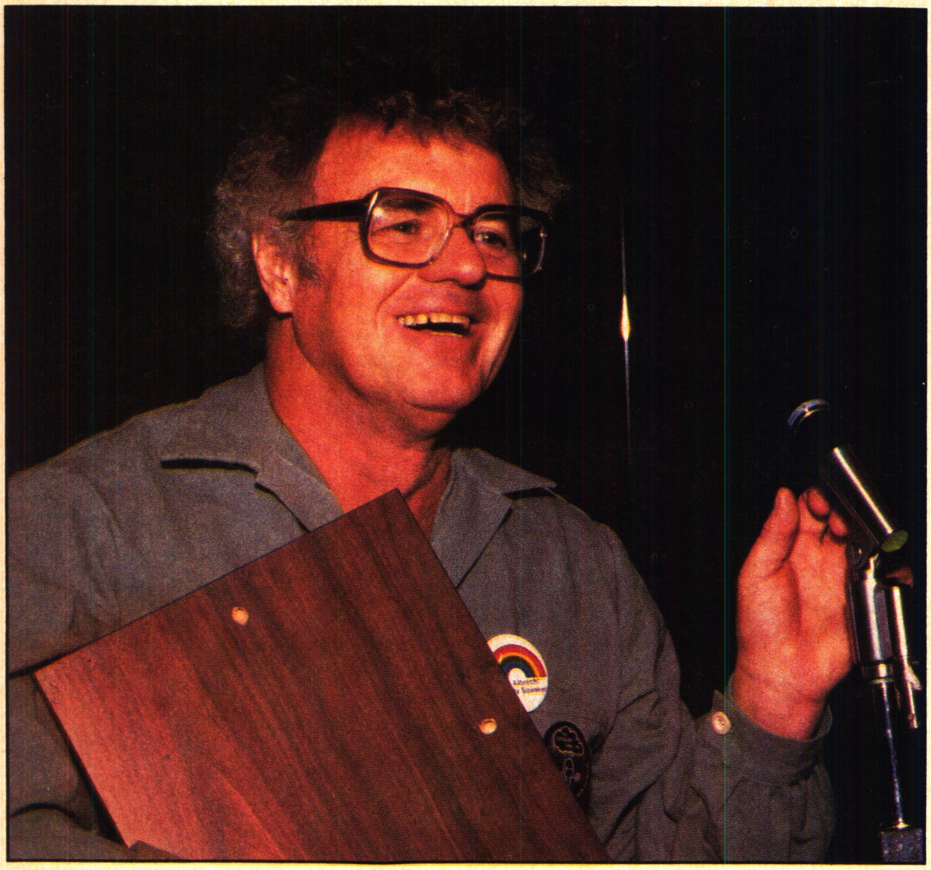
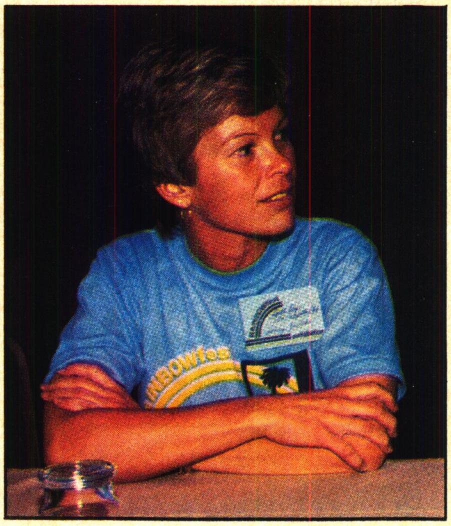
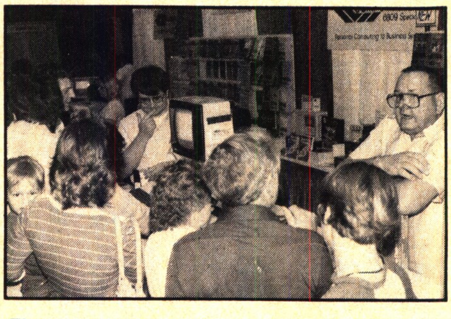
# RAINBOWfest Report:

*Even without corn dogs, it was a three-ring circus weekend for thousands at Long Beach*



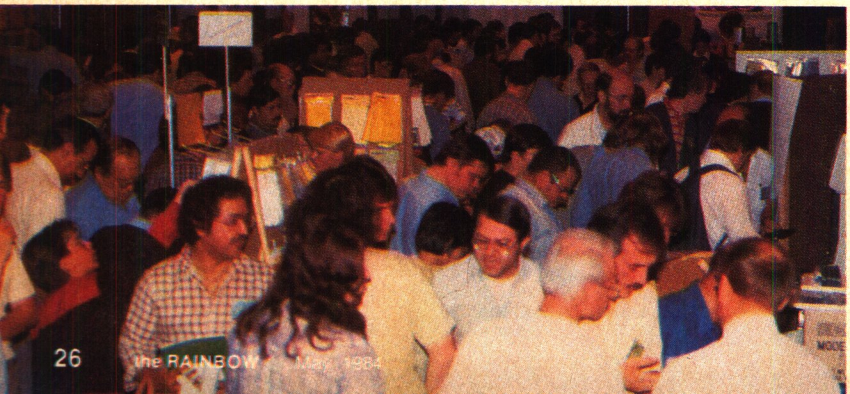


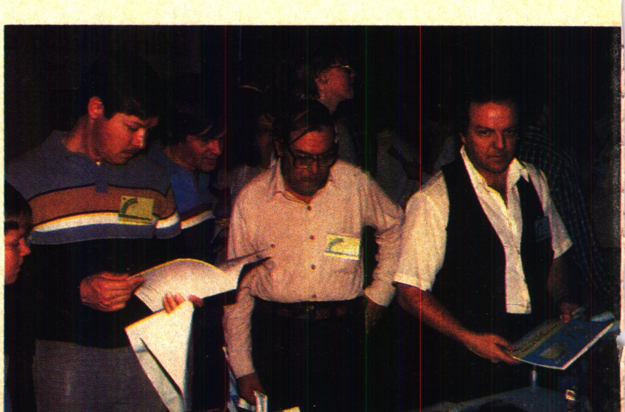
***Sherry Zuehlke, president of the South Bay Color Computer Club, served on the women's program panel.***



***Breakfast keynoter Bob Albrecht (above) celebrated his birthday at RAINBOWfest. The crush of people in the main ballroom exhibit hall (below) gave the three-day event a carnival flavor.***

***The crowd at Computerware (above) wanted programs while books were the thing at the Dymax booth (below).***





For a fleeting weekend, Feb. 17-19, Long Beach, Calif., became CoCo Beach as more than 8,000 Color Computer users flocked to the Hyatt Regency and packed the exhibit hall and seminar rooms to learn about the latest developments for our favorite personal computer.

Our second RAINBOWfest of the season drew people from as far away as Canada, Panama and even England. Those of us from the colder regions enjoyed the palm trees and sunshine even if the weather was a bit brisk for the beach. Content to stay inside, we followed the crowd headed for the main ballroom exhibit hall.

It was like a three-ring circus at times with seminars competing with Radio Shack's CoCo Classroom, and both running during exhibition hall hours. The litany of CoCo Community personalities attending is too long to recite here, but it ranged from CoCo establishment types like Bob Albrecht and Don Inman to real comers like Roger Schrag and controversial mavericks like Dr. Marty Goodman.

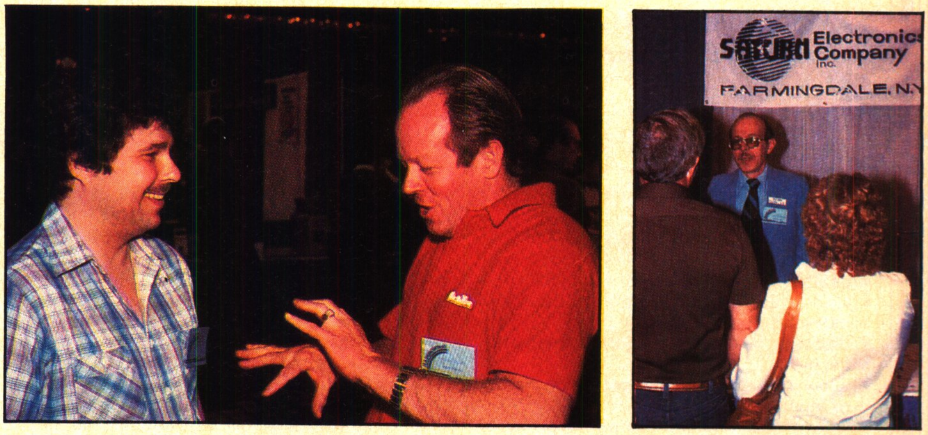
RAINBOWfest CoCo Beach provided a chance for in-depth, one-on-one explanations when time permitted as well as aisle-blocker, crowd-stopper demos that reminded one of the state fair midway barkers hawking vegetable slicer-dicers. Most of those attending were so engrossed in examining the newest in software and hardware that when *the Rainbow's* Jim Reed mistakenly announced that the Radio Shack booth was closing out its 64K ECB machines for just $149, it caused no stir at all. No, there were no corn dogs, but an elaborate Hyatt sandwich station just outside the ballroom drew a lot of takers.

By the end of each day, most people had plenty to fill their shopping bags: souvenir tee-shirts to arcade games, database programs to hard disk drives.

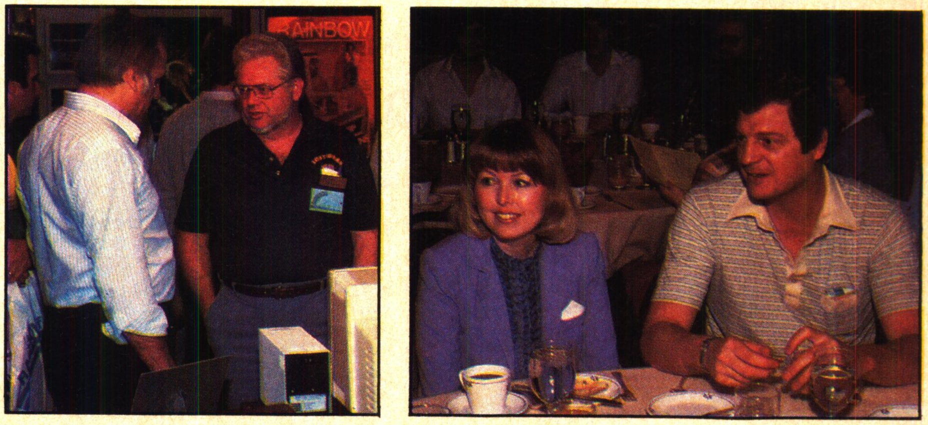
Will we be back next year? You bet! And, in the meantime, we'll visit New Brunswick (March 30-April 1) and Chicago (June 22-24). The CoCo Community and RAINBOWfest are too big to stay in one place.

Speech System

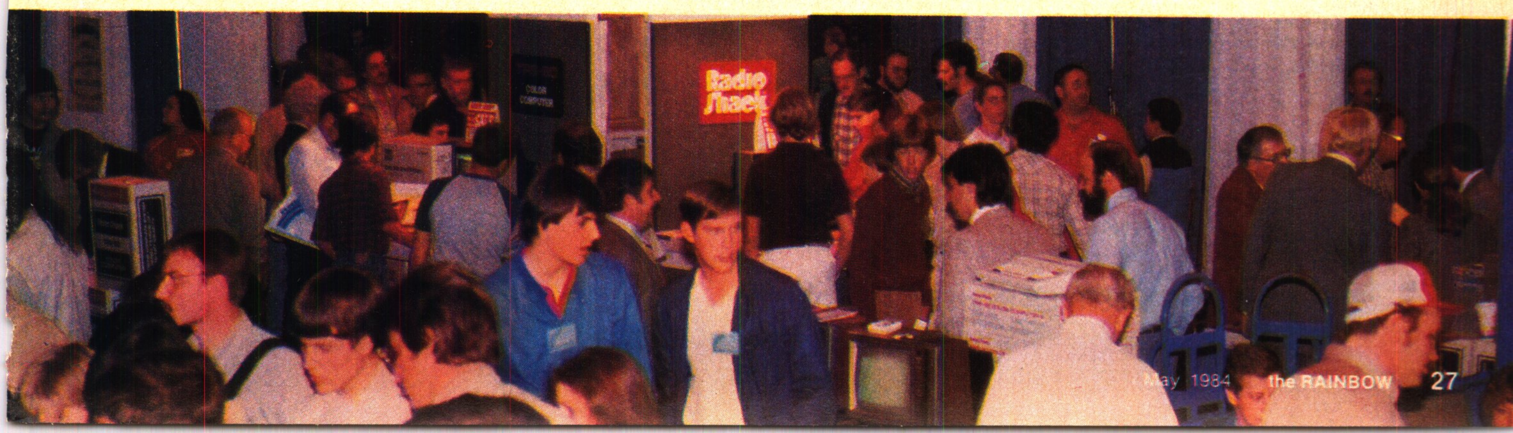
**Richard Parry of Speech Systems discusses voice synthesis and music while Roger Schrag follows up his seminar on machine language with an impromptu chalk talk.**



**Programmer Steve Bjork (left) talks shop with Gordon Monnier of MichTron while Saturn's Arnie Shiffman greets two of the more than 8,000 people attending.**



**Ron Krebs (left) of Mark Data chats with Alex Webster of Software Plus. Sue and Paul Searby get ready for the CoCo Community Breakfast. The Radio Shack exhibit (below) was one of the hubs of activity.**



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- loads and saves data with or without a filename block
- displays memory in hex (or decimal) and ascii
- allows the changing of memory in decimal or hex
- rapidly scans memory using the arrow keys with auto-key repeat
- converts numbers from hex to decimal or decimal to hex
- allows input in hex or decimal
- merges multiple basic programs into one
- appends machine language to basic (example included)
- appends multiple machine language programs into one
- displays the start, end, and execute addresses of ML programs
- displays the buffer start, end, and top addresses
- converts ML programs into basic data statements which can be loaded as, or merged with, a basic program
- turns the audio and cassette motor on and off with one key commands
- finds the end of programs on tape even from within a program with a skip file command
- allows the transferring of control to other programs with a go command
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- allows the changing of the origin (start adds) of ML programs
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SPECIAL REPORT

# In Pursuit Of Captain 'Hook'

## A report on the piracy seminar at RAINBOWfest-Long Beach

By Bill Nolan
*Rainbow* Contributing Editor

One of the best attended and most controversial seminars at the recent RAINBOWfest in Long Beach, Calif. (which was an absolutely outstanding event), was the panel discussion held on the subject of software piracy.

The members of the panel were Martin Goodman, M.D., a general practitioner and anesthesiologist, owner of Cheshire Cat Software, and a CoCo enthusiast; Paul Searby, owner of Computerware; and Bob Rosen, owner of Spectrum Projects, and SYSOP of the Rainbow Connection Bulletin Board. Each of these gentlemen made a short opening comment, and then questions from the audience were fielded. Jim Reed, managing editor of *the Rainbow*, moderated the discussion.

Goodman, who has become well known to CoCo users because of his skill at "breaking" protected software, spoke out strongly in his opening remarks for more communication between software vendors and customers. He also pointed toward what he believed to be a strong need for more accountability from vendors as to advertising claims, warranty, and providing of backup media in a reasonable way.

Searby is an outspoken believer who has taken the lead in anti-piracy campaigns. His opening comments reflected his conviction that piracy (he always says "theft", not "piracy") is the biggest problem facing software vendors and software users alike. He feels that software theft is causing vendors of good software to leave the field, and he cautioned that the currently rampant software theft problem has, and will, result in higher prices and less software being available.

Searby provided a quick overview of the rather extensive costs involved in bringing a new program to the marketplace — costs that often reach $10,000 according to Searby — and he reminded people that these costs must be recovered by the sales of the program. If fewer copies are sold because of piracy, then each copy that is sold has to bring a higher price in order for the vendor to recover his costs, and (hopefully) make a profit. He mentioned also that publishers sell most of their programs to dealers and distributors at about half of the suggested retail price, and that the price has to be set accordingly. Searby also said that some vendors who had previously been a problem from the standpoint of warranty and backup have made great improvements in these areas, due to efforts within the industry to police itself.

During the question period, it was asked why some companies put so much protection onto their tapes and disks that loading becomes a problem. Datasoft, in particular, took a lot of "heat" on this subject, with one dealer in the audience indicating a return rate of 90 percent on *Zaxxon* tapes. A representative of Datasoft responded by saying that Datasoft had not manufactured the tapes. He also provided some numbers to indicate the size of the piracy problem that led them to institute the protection to begin with. Apparently, there were about 5,000 copies of *Zaxxon* sold, (Searby indicated that, with most programs, 3,000 copies sold over a one-year period is considered outstanding), yet there are an estimated *300,000 copies in existence*, for a ratio of 60 stolen copies to every legitimate copy of *Zaxxon*. A member of the audience remarked that when Radio Shack began selling *Zaxxon*, they sold it *without* the protection on the tape.

It was asked what was "public domain," and whether or not programs typed in from magazines were okay to pass around. Reed, from *the Rainbow* fielded this one, and he said that every issue of *the Rainbow*, and almost every other magazine as well, was copyrighted in its entirety, and that in addition, the authors of the various programs retained their own copyright, so these were not "public domain," and could not be legally distributed or placed on bulletin boards.

*(continued on Page 286)*

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*(Bill Nolan and his wife Sara operate Prickly-Pear Software. Bill also teaches computer science at a local college and is DM at a regular weekly fantasy game.)*

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# Marrying Machine Language To BASIC

By Richard A. White
*Rainbow* Contributing Editor

James H. DeStafeno of Swedesboro, New Jersey wrote *the Rainbow* asking a number of questions which might occur to you if you have become conversant with BASIC and start looking at machine language for the first time. He notes that ROM and memory maps are being printed without instruction on how to use them. Other foggy BASIC commands include *CLEAR xxx,yyy*, *USR*, *DEFUSR* and offset loading. *PEEK*, *POKE* and *VARPTR* have been recently covered in *the Rainbow*, but belong with the above commands in that they deal directly with CoCo's memory.

The 6809 microprocessor can directly address 65535 bytes of memory. A memory map describes in a table, diagram or listing where and what is in the memory. The memory map depends on the operating system in the machine at the time. Color BASIC is an operating system that defines a basic memory map for the CoCo. Extended Color BASIC changes this map in detail as it allocates space for the new functions it provides, but does not change its basic structure. Disk BASIC needs room to operate too, so it grabs off some more of the memory and the memory map changes again. If you do a *PRINT MEM* in a Color BASIC machine and then in a Disk BASIC machine, you get a much smaller number in the Disk machine. The memory is still there, but Extended BASIC and Disk BASIC are using it.

**Extended Color BASIC Computer Memory Map**

| Decimal Address | Contents | Hex Address |
|---|---|---|
| 0-1023 | System Use | 0-3FF |
| 1024-1535 | Text Screen Memory | 400-5FF |
| | **Graphic Screen Memory** | |
| 1536-3071 | Page 1 | 600-BFF |
| 3072-4607 | Page 2 | C00-11FF |
| 4608-6143 | Page 3 | 1200-17FF |
| 6144-7679 | Page 4 | 1800-1DFF |
| 7680-9215 | Page 5 | 1E00-23FF |
| 9216-10741 | Page 6 | 2400-29FF |
| 10742-12287 | Page 7 | 2A00-2FFF |
| 12288-13823 | Page 8 | 3000-35FF |
| 13824-16383 | **Program and Variable** Storage 16K Machine | 3600-3FFF |
| 16384-32767 | **Program and Variable** Storage 32K Machine | 4000-7FFF |
| 32768-40959 | Extended BASIC ROM | 8000-9FFF |
| 40960-49151 | Color BASIC ROM | A000-BFFF |
| 49152-65279 | Cartridge Memory | C000-FEFF |
| 65280-65535 | Input/Output | FF00-FFFF |

Let's examine the above memory map in some detail. In the first 1,023 bytes, BASIC keeps its notes that it needs to run. These are things like the address of the start of BASIC (25 and 26), the end of BASIC (27 and 28), variable table addresses, the end of memory and a myriad of other details. Ever wonder how BASIC keeps track of where the cursor is on the text screen? That's in 136 and 137. When you type on the keyboard, things generally don't happen other than characters appearing on the screen until you press [ENTER]. That's because the characters are saved in a memory area

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*(Richard White has a long background with microcomputers and specializes in BASIC programming. Along with Don Dollberg, he is the author of the TIMS database management program.)*

called a buffer until a carriage return character is sent by the [ENTER] key. This BASIC line input buffer starts at decimal 832 and is 255 bytes long.

Another important buffer is the cassette file data buffer which starts at decimal 471 and is 256 bytes long. When you output data to a cassette file, data is temporarily stored here until the buffer is full and then dumped to tape. Upon loading a cassette file, data is stored here for BASIC to read and process. Other earlier computers didn't have such a buffer and each piece of data was individually sent to tape along with a time consuming header. Loading or saving a file can be an all night chore with these machines.

It is well beyond the scope of this column to deal individually with each item in BASIC's scratchpad; most you will never need to use directly. Some you set using BASIC commands, but BASIC does the work for you. In any case, this 1K chunk of memory is one of the most used in your machine. While it is not included in the number you get when you *PRINT MEM*, it is working hard for you nonetheless.

Next comes the vital screen memory. It extends from decimal 1024 to 1535 and has one byte for each possible character location on your text screen. When you print to the screen, BASIC stores the characters here. Your video display generator chip (6847) reads this data and converts it into the picture it sends to your TV or monitor. Your video display generator chip deals with graphics in much the same way when you use the graphics modes. It reads the assigned memory area and generates a picture. Motorola devised this method years ago for use with the 6800 microprocessor. In a recent article in *BYTE* magazine, Apple people were making a big thing about using the technique in the new MacIntosh. The only thing different is that the Mac uses a 68000 instead of a 6809 and has a 22K graphics memory space rather than the 6K used for high resolution graphics in the CoCo. The 8088 microprocessor in the IBM PC works differently from the 6809 or 68000 and a whole board of chips are necessary to do what one or two chips do in CoCo or Mac. This is one of those details that explain why a $260 machine can do so much of what a $3,000 machine will do.

Next come the graphics pages. Color BASIC does not have graphics capability from BASIC, so the BASIC program default start address is 1536. On a cold start, Extended BASIC reserves four pages for memory, so the start of a BASIC program is at 7680, but you can use *PCLEAR* to change this.

For example, if you enter *PCLEAR1*, only the first graphics page is reserved, and the BASIC program will load starting at 3072. This allows 12,711 bytes for BASIC program and variables in a 16K machine. On the other hand, a *PCLEAR8* moves the start of BASIC all the way up to 13824 leaving a trifling 2,559 bytes for BASIC and variables.

In a 32K or 64K machine, the RAM between 16384 and 32767 is all available for program and variables. In a Color BASIC machine, this is a large 31,231 bytes. With Extended Color BASIC, *PCLEAR1* allows 29,695 bytes, there are 25,087 bytes available with *PCLEAR4* and 18,933 available with *PCLEAR8*.

If you do a *PRINT MEM* under one of the combinations described above after a cold start, the number returned will be 200 bytes smaller than I show. If you have an Extended BASIC machine and enter *PRINT MEM* immediately after turning it on and getting the Extended BASIC message, you will read 24,887 rather than 25,087. The difference is the 200 bytes that BASIC automatically reserved for strings. You change this by using *CLEAR 100* to reduce it to 100 bytes. Maybe your program is going to store a lot of string data so you *CLEAR 5000* or even *CLEAR 10000*. This reserved space is no longer available for a BASIC program and most variables. Only string data can be placed there. It's not lost since you have to put string data somewhere. The trick is to size your string storage to meet your program's needs without unduly limiting your program's size.

> *"The trick is to size your string storage to meet your program's needs without unduly limiting your program's size."*

*CLEAR* can carry two arguments, for example *CLEAR 200,27000*. This says that BASIC may not use any memory above 27000 in a 32K machine, and that the 200 bytes just below 27000 in memory are reserved for string storage. Machine language programs may be loaded above 27000 and *EXECuted* without fear of being "walked-on" by BASIC. Prickly Pear's *Colorkit* is a machine language set of editing tools that I always have running when I do any serious BASIC programming work. It starts at 27000 in my 32K machine so I have to type *CLEAR 200,27000* from the keyboard before loading it. Otherwise, CoCo goes west and I have to turn it off and back on to recover. You want to reserve only the amount of memory for machine language that you need. I used *CLEAR 200,27000* since that is what is required to use *Colorkit*. If you had a 1,000-byte machine language program then *CLEAR 200,31767*.

We have slid into the dual operation of BASIC and machine language programs at the same time. In the example above, *Colorkit* can be running while you run the BASIC program you are working on. Actually there are three programs working simultaneously since your BASIC interpreter is a machine language program. Really, each is taking its own turn and then handing control back to another. Overall control of this rests with addresses or "hooks" stored in the system portion of memory below 1023. We are getting deep fast here, and disengagement is preferable to total confusion. Perhaps this leaves you with some flavor of what can be going on that we do not see clearly.

A simpler exercise is to store a machine language routine in memory and call it from a BASIC program when you want to use it. Starting with Color BASIC, you need to *POKE* the execution address of the machine language into memory locations 275 and 276. Then when you need to call the routine from inside a BASIC program, you use the statement *A=USR(0)*. You can write your machine language routine to use the ROM call *INTCNV* to get the argument with *USR, 0* in this case and put it in the D register of the microprocessor. Generally you won't want to bother with this. You can also transfer data to the machine language routine by *POKEing* values to some reserved area of memory. The routine then can get the values, work on them and then store new values for BASIC to get by peeking. Now you are really down at the machine level, dealing with memory on a byte-by-byte basis.

Some have been trying to get a handle on assembly or machine language programming by trying to understand how to interface it with BASIC. A better way is to learn assembly language, at least the simpler aspects, and then work back to the interface with BASIC. When you understand what simple machine language programs are and how they work, you will understand more clearly what the BASIC interface tools are doing. *TRS-80 Color Computer Assembly Language Programming* by William Barden, Jr., Radio Shack cat. no. 62-2077, is a good starter reference.

Extended Color BASIC broadens the machine language interface, allowing a BASIC program to call any of 10 machine language routines (numbered 0 to 9). First the execution address of each routine to be used must be defined to BASIC, not *POKEd* into memory as with Color BASIC. The format is — *DEFUSRn* = address. Say I had three routines whose execution addresses were 31000, 31500 and 32000, each address being also the first byte of each routine. Before loading these into the computer, either the program or the operator would need to do *CLEAR xxx,31000* to protect the machine language area. Next the BASIC program would need to define the execution addresses as follows —*2000 DEFUSR0=31000 : DEFUSR1=31500 : DEFUSR2 = 32000*. A machine language routine is then called with a *USRn* statement — *A=USRn(B)*. To call routine one, use *100 A=USR1(0)*. When the routine completes its work, control is returned to either the next statement in the line or to the next line in the BASIC program.

While it is desirable to put machine language routines either below BASIC in

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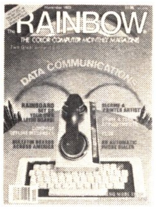

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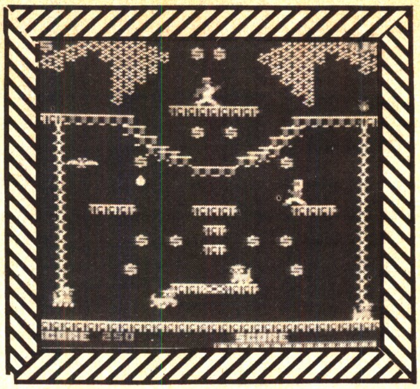
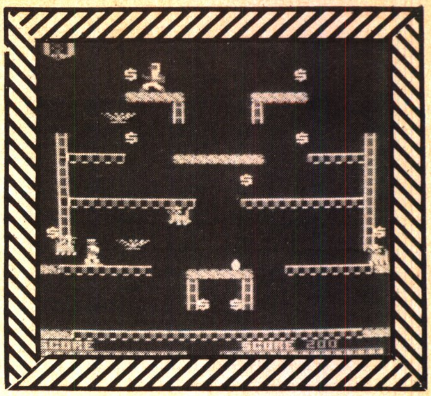
# CASHMAN

*By Doug Frayer and Bill Dunlevy*





The screen is exploding with colorful, fast moving animation like you've never seen. The speaker is alive with every kind of sound imaginable! Best of all, the player's eyes are glowing with fascination and wonder of this classic creation. THE GAME??? CASHMAN! So colorful, so imaginative, so all out fun, that you'll wonder why you ever settled for anything less!

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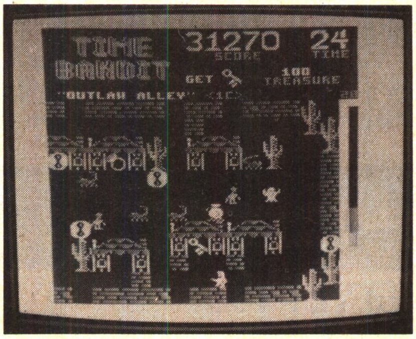
CASHMAN's classical play is so original and so much fun that no arcader whether a veteran or a rookie, can afford to pass it up.

So run, jump, climb, or fly to the nearest Color Computer and play the ultimate . . . CASHMAN! (P.S. CASHMAN lets you play against the computer or play 2 players simultaneously.)

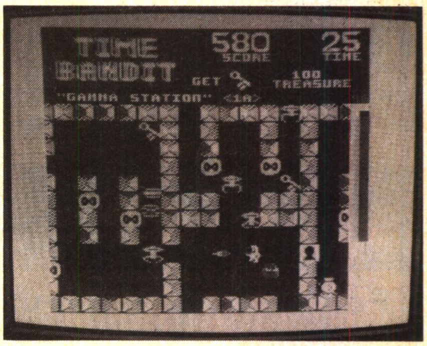
32K COLOR COMPUTER TAPE ........ $27.95 DISK ........ $29.95

# TIME BANDIT

This month is the first month that the entire top ten panel had copies of TIME BANDIT and they overwhelmingly voted it into first place. Never before has a game received so many first place votes. At the Dallas RAINBOWfest and at the Pasadena Color Expo, arcade players were unanimous in the praise of TIME BANDIT. "The best original game ever written for the COCO" . . . "My dad said I could buy only one game and this is the best game here" . . . "Best game at the show" . . . "Best game I've ever seen on a home computer" . . . "Great Game" . . . "Only game I bought at the show" . . . These are comments we heard about TIME BANDIT at these two shows . . . I can say without a doubt that TIME BANDIT is the best game on the market for the COCO.



**WESTERN WORLD:** Visit the Lost Maverick Mine, Dead Man's Pass, (Visit? Escape!) Tombstone Jail, and many more! A variety of screens.



**SPACE WORLD:** Explore Hy-perspace, the bizarre Light Barriers, the Insidious Grid, Gamma Station the Enterprise and others! Bright, Clear graphics!

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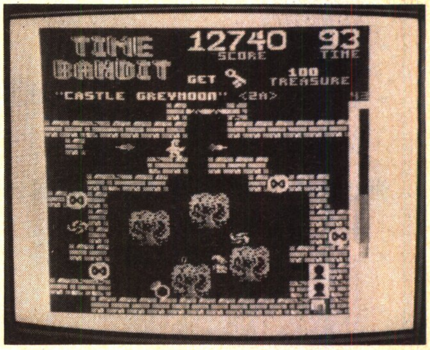

**FANTASY WORLD:** Conquer the halls of Doom, the Mystic Maze, the Underworld Arena, and other medieval places. Pictured are the three different time gates.

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the graphics pages if you are not using graphics or in a protected space at the top of memory, it is not necessary that they be assembled in the final memory location. In other words, routines that are written in relocatable code can be moved around in memory and still work. If you upgrade to a 32K or 64K machine, you would like to take advantage of that memory and you cannot if you continue to load machine language routine in protected memory below 16383. Yet your routines on cassette or disk are made to load into the lower memory area. Offset loading to the rescue. In a simple move from 16K top-of-memory to 32K top-of-memory, do *CLOADM "PROGNAME", 16384* or *LOADM "PROGNAME", 16384*. The program will load 16384 bytes higher in memory. To make it easy later, *C-SAVEM* or *SAVEM* the program from higher memory using the new start, end and execute addresses. It will now be on your tape or disk with these new addresses and can be loaded directly without offset.

One of the neater tricks around is to hang your machine language routines onto your BASIC programs so they load and save with the BASIC program.

To understand this, we need to know what the end of a BASIC program looks like and to what address the end of BASIC pointer at locations 27 and 28 points. Each line of BASIC in memory ends with a zero. There are three zeros in a row at the end of a BASIC program. The end of BASIC pointer carries the address of the memory location following the third zero. Load a machine language routine starting at the second zero marking the end of BASIC, then add three zeros after the machine language and change end of BASIC to hold the address following the new three zeros. At minimum, you will need a machine language monitor program that can read and change individual memory locations. *Colorkit* includes both the monitor and a utility to attach the machine language routine automatically to a BASIC program. Now when you save and load the BASIC program, the machine language loads and saves with it. If you edit the BASIC program, its length changes and the machine language is moved up or down in memory with the program.

The next problem is to call the machine language whose execution address changes from time to time as you edit BASIC. Since the end of BASIC pointer changes the same amount and direction as the location of the machine language, we can use it for a reference. In Extended BASIC, this will do the job: _100 DEFUSR0 = 256*PEEK(27) + PEEK (28) – X_ where X is the number of bytes from end of BASIC to the execution address of your routine.

Now why would one want to play silly games like we have been talking about? Program speed is one good reason. A sorting routine in BASIC is slow, even if you use the fastest type of sort. In comparison, even the slowest sorting method in machine code is 10 to 100 times faster. Writing a whole program in machine code would be a real drag. Writing just a sort and hooking it to a BASIC program that does as well as the rest of the things you want done is much less painful. Games are another area that benefit from the use of key machine language routines doing only things that BASIC is slow at.

My, how far we have strayed from our memory map discussion. Thus far our adventures have been confined to the lower 32K of memory. At first blush, the memory space from 32768 to 65280 seems pretty simple. In order

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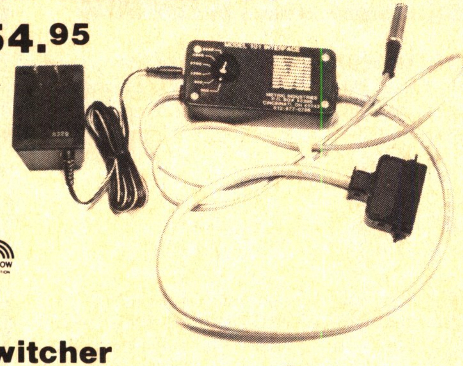

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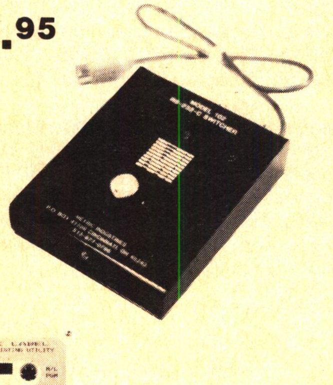

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there is the Extended BASIC ROM, the Color BASIC ROM, cartridge memory and input/output. The Disk BASIC ROM occupies the lower 6K of the cartridge memory space in a disk system. At minimum, Color BASIC and input/output, our beloved SAM chip (6883), must be present to provide a minimum operating system. Using either cassette or disk, machine language routines can be loaded that cause drastic memory map changes to occur. Some of these have been published in recent back issues of *the Rainbow*. A first step is to copy the ROMs to low memory, switch CoCo to 64K RAM and copy the ROM code back into upper memory in the same locations that it occupied in ROM. Next it was discovered that Extended Color BASIC is entirely relocatable, and that if it is moved above Color BASIC or Disk BASIC, that BASIC could use RAM up to 40959. This is the so called 40K move and a number of commercial and published programs are available. Another interesting approach is the one developed by Jorge Mir to modify a BASIC program and load it above Disk BASIC. This is in the October 1983 *Rainbow*.

Another tact is to switch the upper 32K RAM in and out under control of a machine language program and use the upper RAM for data storage. BASIC is operational whenever the machine is in the ROM mode. Under these conditions, 96K of memory space is in use. In any case, the memory map is one thing at one time and something else at another. These are enhancements to the BASIC operating environment and do not cause major changes to BASIC. Properly written, a BASIC program that runs in the normal ROM-RAM map should run in an all RAM or switched mode as well. Changes required should be restricted to those necessary for the program to take advantage of its new environment.

At this point there is much that I have not covered and some that I have touched only lightly. The disk system memory map is one that is not discussed. One reason is that it varies depending on how many disk buffers are in use. Another is that there are many more non-disk readers than those with disks. The whole area of switching from ROM to RAM in the upper 32K space could well be the subject of a separate article apart from this column. For now, let's get the basics in place, even when they seem rather complex themselves.

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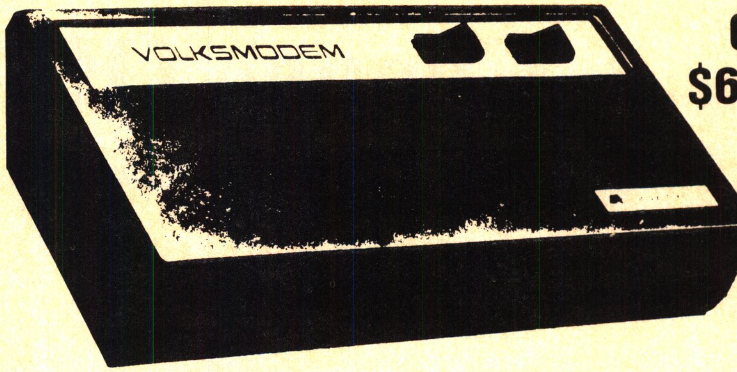

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16K
ECB

# A Change Of Address

### By Dennis Derringer

Recently, quite a few programs have been popping up that show an effective means of relocating machine language programs in memory. Of course, to have a machine language program load at a higher address only requires an offset value placed after the filename when it's *LOADMed.* Unfortunately, Microsoft didn't include a syntax for negative offsets to load programs lower in memory. This spurred the challenge to offer a means of relocating programs after they're loaded in memory. Most of these programs dealt with a technique using *PEEK* and *POKE*, either in BASIC or a machine language version, to move an area of memory from one location to another. Effective, yes, but it still required you to calculate the new *LOAD, EXEC* and *END* addresses so that it can be *SAVEMed.*

Being one who likes things nice and simple, I proceeded to find a quick method to relocate machine language programs and at the same time, have the addresses changed. Studying the method by which a machine language program is stored on disk revealed that the three magic numbers are right there on the disk with the program. All that was needed was a routine that could read these numbers and then have new ones put in their place. This is where the flexibility of *RS-DOS* really proved outstanding.

Regardless of how a file is stored, you can *OPEN* it for direct (random) access with a record length of one and then, by checking the length of the file (LOF), obtain the exact number of bytes that it contains. For machine language programs, the second and third byte in the file represent the MSB and LSB values for the LENGTH of the program. The fourth and fifth bytes represent the MSB and LSB values for the *LOAD* address. The last two bytes in the file represent the MSB and LSB values for the *EXEC* address. The actual numbers for the MSB and LSB values are the ASCII value of the character. The number which they represent is calculated by the formula MSB*256+LSB.

The utility program will obtain these values and let you indicate a new *LOAD* address. The LENGTH and *EXEC* values are automatically recalculated and then the new values are stored back on the disk. This is how the program breaks down:

| Line | |
|---|---|
| 90-180 | Receive input for filename and get values from disk (include extension). |
| 200-250 | Display values and receive input for new *LOAD* address. |
| 270-390 | Calculate new values, display values and store result back on disk. |

This routine works with any program that has been *SAVEMed* using the standard syntax. Exercise caution when using with commercially purchased software, they don't always use standard techniques.

250 ....... 151
END ...... 111

**The listing:**

```
10 '**************************
20 '* CHANGE ML ADDRESS ON   *
30 '* DISK.  32K EXT. DISK   *
40 '* BY DENNIS DERRINGER    *
50 '* DERRINGER SOFTWARE, INC*
60 '* JANUARY - 1984         *
70 '**************************
80 CLS:CLEAR 1000
90 PRINT"FILENAME: ";:LINE INPUT
 FI$
100 IF FI$="" THEN END
110 OPEN"D",#1,FI$,1:IF LOF(1)=0
 THEN CLOSE:KILL FI$:RUN
120 FIELD#1,1 AS F$:LF=LOF(1)
130 FORQ=1TO5:GET#1,Q:BY(Q)=ASC(
F$):NEXTQ
140 B=0:FORQ=LF-4 TO LF:B=B+1
150 GET#1,Q:BE(B)=ASC(F$):NEXTQ
160 LD$=HEX$(BY(4)*256+BY(5))
```

---

*(Dennis Derringer, president of Derringer Software, Inc., is a self-taught programmer and has been marketing software for the color computer since 1982.)*

```
170 E$=HEX$(BE(4)*256+BE(5))
180 LN$=HEX$(BY(2)*256+BY(3))
190 PRINT
200 PRINT"LOAD ADDRESS = ";LD$
210 PRINT"END ADDRESS  = ";HEX$(
VAL("&H"+LD$)+VAL("&H"+LN$))
220 PRINT"EXEC ADDRESS = ";E$
230 PRINT"LENGTH       = ";LN$
240 PRINT
250 PRINT"NEW LOAD ADDRESS = ";:
LINE INPUT NL$
260 IF NL$="" THEN CLOSE:RUN
270 OF=VAL("&H"+E$)-VAL("&H"+LD$
)
280 NL=VAL("&H"+NL$)
290 NE=NL+OF
300 BY(4)=INT(NL/256)
310 BY(5)=NL-(256*(INT(NL/256)))
320 BE(4)=INT(NE/256)
330 BE(5)=NE-(256*(INT(NE/256)))
340 PRINT"NEW END ADDRESS  = ";H
EX$(NL+VAL("&H"+LN$))
350 PRINT"NEW EXEC ADDRESS = ";H
EX$(BE(4)*256+BE(5))
360 FORQ=1TO5:LSET F$=CHR$(BY(Q)
):PUT#1,Q:NEXTQ
370 B=0:FORQ=LF-4 TO LF:B=B+1
380 LSET F$=CHR$(BE(B)):PUT#1,Q:
NEXT Q
390 CLOSE
400 PRINT:PRINT"PRESS enter TO R
UN AGAIN ";:LINE INPUT X$
410 RUN
```

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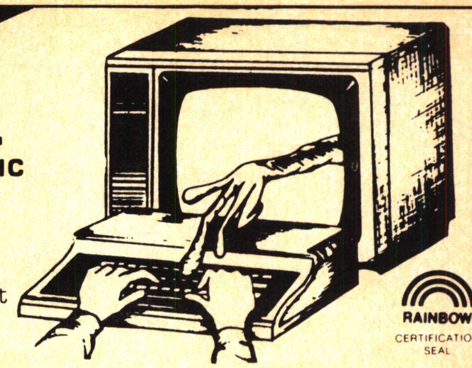

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# Color Graphic Banner

By Doug Lindsay

This article describes, in detail, modifications that I have added to a fine program by Mr. David Steyer (see *the Rainbow*, January 1983, Page 190). The modifications are designed to take advantage of some of the capabilities of Radio Shack's CGP-220 and produce "solid" color or inverse graphic characters using the CGP's "bit-image" mode. If you liked this program running in the non-graphics mode, as I did, then I'm sure you will enjoy the colorful result of this modification running your CGP-220. The printer control code additions/modifications, which represent the primary alterations, are documented within the BASIC program lines and, although they are for the CGP-220, probably are easily adaptable to codes for other printers capable of "bit-image" graphics.

*Color Graphic Banner* utilizes the ability of the CGP-220 printer to switch back and forth between the text and bit-image modes. The text mode is the mode the printer is in when it is switched on and is primarily utilized to print alpha-numeric characters. By using special printer control codes, the CGP can alter the color of text characters and can be set to the bit-image mode, in which it "assumes" that it will receive instructions for printing a dot or column of dots (up to seven dots high) in one or more of up to 640 such columns across in one row. In addition, upon entering the bit-image mode the printer "assumes" that any such rows of dot-columns will be adjacent to one another vertically and, thus, a line-feed in this mode leaves no space between rows. When exiting the bit-image mode, the color, and other conditions, which existed prior to entry, are restored.

With this information in mind, I shall discuss all the changes in the listing that follows.

*(Doug Lindsay is a personnel analyst for the City of Everett (Wash.) He possesses a bachelor's degree in psychology and a master's in public administration. Doug finds satisfaction in both serious and not-so-serious Color Computer programming.)*

The first modification occurs in line 60 which clears twice as much string space, since I chose to add strings in which to build graphics information and store control codes while retaining the original string variables. The poke in line 60 is optional and allows data to be sent at the highest rate at which the CGP-220 can operate. You must, however, make sure that the Baud rate select switch (located on the rear panel of the printer) is placed next to the proper setting. That is, if you elect *not* to use the poke, set the switch next to the number 600. If you leave the poke in, set the switch next to the number 2400.

Line 100 contains a change in the input to variable "LG" and, thus, allows for selection of the CGP's 91 text-column line width.

Line 120 prompts for a wider (seven instead of five) suggested character width because the bit-image line-feed compacts rows of graphics which makes the *Color Graphic Banner* characters narrower than the non-graphic ones.

Line 145 adds a brand new input statement which prompts the user to select a character color and stores the numerical code for the selection in the variable "CL." The color codes are listed in the CGP-220 manual, but please note that I have chosen to modify two of the designations. I'm sorry, but what the book calls violet looks like blue to me and vice versa.

Line 275 directs storage of a series of control codes in variable "LF$." CHR$(18) places the CGP in the bit-image mode, CHR$(13) does a line-feed (remember, it's compact because of the bit-image mode) and CHR$(30) causes an exit from the bit-image mode, as well as restoration of all prior text mode conditions. This allows using simpler BASIC commands to send blank spaces to the printer rather than utilizing a more complex print-head positioning routine.

Line 485 simply sends the CGP's color change control code CHR$(27) "T" followed by the numerical color code stored in variable "CL."

Line 510 retains the original program's string variable "B$" to control centering of graphic characters on the banner. Lines of characters are built in a new variable "GF$." This variable builds a line of "solid" color and/or spaces of a particular height (as specified in variable "HH"). The actual color graphic portion of the line consists of the following: CHR$(18), for bit-image initiation; CHR$(28), signals repetitions of a graphics dot-column; CHR$(HH*7), sends the number of repetitions; CHR$(255), defines the dot-column pattern to be repeated (in this case it is a 7-dot column). This sequence of codes causes printing of HH*7 dot-columns in a row. Each column, in turn, is 7 dots high. CHR$(30), as you may recall, causes exit to the text mode. The "solid" color graphic effect, of course, results from the density of the lines of color dot columns "packed" together by means of the bit-image line-feed. The banners produced are colorful and easily read even from quite a distance.

Line 540 clears the graphic line-building strings before looping to set up the next line of graphic information to be sent.

Line 555 sends a line-feed code merely to empty the printer buffer and, thus, avoid incidental printing of garbage. This line also clears the screen and prompts for an easy restart. I have found that mixing various colors of letters, words and/or symbols by creating them one at a time can yeild eye-catching banners, nametags, labels etc.

Line 560 restarts or prints some colorful credits, prior to setting the print color to black and ending the program.

As Mr. Steyer stated in the article that was published with the original version, the program supports all ASCII characters (though the lowercase letters are sans descenders) and I've found that attractive name tags can be generated in the inverse mode. For example, try a character height setting of one and width of two. These settings yield elongated graphic characters such as those in the sample output.

I hope you have fun creating your messages in bright color graphics. Kids of all ages seem to take great pleasure in seeing their name in a *Color Graphic Banner* and, if you're not too shy, you can drop hints that CGP ink packs (as well as paper) make really nice gifts!

| | |
|---|---|
| 145 | 80 |
| 320 | 12 |
| 485 | 161 |
| 580 | 233 |
| END | 189 |

**The listing:**

```
60 CLEAR 500:POKE 150,18 ' MOD T
O CLEAR EXTRA STRING SPACE AND P
OKE CGP'S HIGHEST (2400) BAUD RA
TE
70 DIM A$(3),D$(4),E$(6)
80 GOSUB 580
90 CLS:PRINT"* C. G. B A N N E R
 *":PRINT"BY DAVID STEYER":PRINT
"WITH CGP MODS BY DOUG LINDSAY":
PRINT
100 INPUT"91 OR 132 COLUMN PRINT
ER (9/13)";LG:IF LG=9 THEN LG=91
 ELSE IF LG=13 THEN LG=132 ELSE
'CGP MOD FOR 91 COL. CAPABILITY
110 PRINT"CHARACTER HEIGHT (1-";
```

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```
INT(LG/10)")";:INPUTHH:IF HH<1 O
R HH>INT(LG/10) THEN 110
120 PRINT"CHARACTER WIDTH (1-10)
":IFLG=91 THEN PRINT"(7 OR LESS
RECOMMENDED)" ' CGP MOD FOR SLIG
HTLY WIDER CHARACTERS BECAUSE OF
 COMPACT BIT-IMAGE LINE FEED
130 INPUTWD:IF WD<1 OR WD>10 THE
N 120
140 INPUT"INVERSE (Y/N)";Y$:IF Y
$="Y" THEN Y$=" " ELSE Y$="1"
145 INPUT"COLOR (BK/R/G/Y/V/M/BL
)";CL$:IFCL$="BK"THENCL=48 ELSEI
FCL$="R"THENCL=49 ELSEIFCL$="G"T
HENCL=50 ELSEIFCL$="Y"THENCL=51
ELSEIFCL$="V"THENCL=52 ELSEIFCL$
="M"THENCL=53 ELSEIFCL$="BL"THEN
CL=54 ELSE145 ' CGP MOD LOADS PR
INTER COLOR CODE INTO CL
150 PRINT"ENTER BANNER TEXT (32
CHARACTER LIMIT)"
160 LINEINPUT TX$
170 IF TX$="" OR LEN(TX$)>32 THE
N 150
180 A$=A$(RY)
185 LF$=CHR$(18)+CHR$(13)+CHR$(3
0) ' CGP MOD LOADS PRINTER CONTR
OL CODES FOR BIT-IMAGE LINE FEED
 INTO LF$
190 PMODE4,1:PCLS1:SCREEN 1,0
200 IF Y$=" " THEN PCLS0
210 FOR I=1 TO LEN(TX$)
220 A=ASC(MID$(TX$,I,1))-32
230 IF A<24 THEN RY=0 ELSE IF A<
47 THEN RY=1 ELSE IF A<70 THEN R
Y=2 ELSE RY=3
240 A=A-(RY*23)
250 FOR X=0 TO 4
260 IF A=0 THEN Y=0:GOTO280
270 Y=VAL("&H"+MID$(A$(RY),((A-1
)*10)+(X*2)+1,2))
280 D$(X)="        "
290 IF Y>127 THEN Y=Y-128:D$(X)=
"1       "
300 IF Y>63 THEN Y=Y-64:D$(X)=LE
FT$(D$(X),1)+"1      "
310 IF Y>31 THEN Y=Y-32:D$(X)=LE
FT$(D$(X),2)+"1     "
320 IF Y>15 THEN Y=Y-16:D$(X)=LE
FT$(D$(X),3)+"1    "
330 IF Y>7 THEN Y=Y-8:D$(X)=LEFT
$(D$(X),4)+"1   "
340 IF Y>3 THEN Y=Y-4:D$(X)=LEFT
$(D$(X),5)+"1  "
350 IF Y>1 THEN Y=Y-2:D$(X)=LEFT
$(D$(X),6)+"1 "
360 IF Y>0 THEN D$(X)=LEFT$(D$(X
),7)+"1"
370 NEXT X
380 E$(0)=LEFT$(D$(0),5)
```

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```
390 E$(1)=RIGHT$(D$(0),3)+LEFT$(
D$(1),2)
400 E$(2)=MID$(D$(1),3,5)
410 E$(3)=RIGHT$(D$(1),1)+LEFT$(
D$(2),4)
420 E$(4)=RIGHT$(D$(2),4)+LEFT$(
D$(3),1)
430 E$(5)=MID$(D$(3),2,5)
440 E$(6)=RIGHT$(D$(3),2)+LEFT$(
D$(4),3)
450 FORX=0 TO 6:FOR Y=1 TO 5
460 IF MID$(E$(X),Y,1)=Y$ THEN P
RESET(Y+(I-1)*8,3+X) ELSE PSET(Y
+(I-1)*8,3+X)
470 NEXTY,X
480 NEXT I
485 PRINT#-2,CHR$(27) "T" CHR$(C
L) ' CGP MOD SENDS CONTROL CODE
FOR COLOR (CL) SELECTED IN LINE
145 TO PRINTER
490 FOR I=LEN(TX$)*8 TO 0 STEP-1
500 FOR Y=1 TO 10
510 IF PPOINT(I,Y)=0 THEN B$=B$+
STRING$(HH,"*"):GF$=GF$+CHR$(18)
+CHR$(28)+CHR$(HH*7)+CHR$(255)+C
HR$(30) ELSE B$=B$+STRING$(HH,"
"):GF$=GF$+STRING$(HH," ") 'CGP
MOD IN THIS LINE BUILDS LINES OF
 "SOLID" COLOR AND/OR SPACES IN
GF$
520 NEXTY
530 FOR R=1 TO WD:PRINT#-2,STRIN
G$(INT(LG-LEN(B$))/2,32);GF$;:PR
INT#-2,LF$;:NEXT R ' CGP MOD IN
THIS LINE SENDS COLOR/SPACES (GF
$) AND BIT-IMAGE LINE FEED (LF$)
 TO PRINTER. NOTE THAT B$ IS RET
AINED TO GOVERN THE CENTERING OF
 CHARACTERS ON THE PAPER
540 B$="":GF$="" ' CGP MOD HERE
CLEARS GRAPHICS STRING (GF$)
550 NEXT I
555 CLS:PRINT#-2,LF$:PRINT@203,"
AGAIN Y/N?"; ' CGP MOD HERE SEND
S A LINE FEED TO CLEAR THE PRINT
ER BUFFER.  REMAINDER OF THIS LI
NE ALLOWS EASY RE-ENTRY WHEN CHA
NGING LETTER OR WORD COLOR
560 A$=INKEY$:IFA$=""THEN560ELSE
IFA$<>"Y"THENPRINT#-2," * C. G.
B A N N E R * BY DAVID STEYER 19
82  RAINBOW MAGAZINE":PRINT#-2,C
HR$(27)"T"CHR$(54);"with CGP-220
 mods by Doug Lindsay 1984":PRIN
T#-2,CHR$(27)"T"CHR$(48);STRING$
(10,10):ENDELSE90
580 A$(0)="6318C03180528000000000
2B60DA8007568E2D5C0C644444C60452
88AC9A0111000000000888420820820884
22200011DF710000109F210000000C61
1000001F0000000000003180004444400
074675CC5C023084211C074426443E07
44260C5C01195F10840FC21E0C5C0746
1E8C5C0FC44442100"
590 A$(1)="7462E8C5C07462F0C5C00
318063000630 0C611000888820820003
E0F800082082222007444420080 7442D
AD98022A31FC620F463E8C7C07461084
5C0F46318C7C0FC21E843E0FC21E8420
074610BC5C08C63F8C62071084211C03
884214980 8CA98A4A2084210843E08EE
B58C6208C7359C620"
600 A$(2)="746318C5C0F463E842007
4631ACDE0F463EA4A207460E0C5C0F90
84210808C6318C5C08C6318A8808C635
AEE208C544546208C5442108 0F844E44
3E039084210E00410410400E10842138
023AA42108001111F410000000000000 0
01C17C5E0843D18C5C0001F0841E0085
F18C5C0001D1F41C0"
610 A$(3)="0191E421000001F1785C08
43D18C62020184211C01004214980842
32E4A2061084211C0003D5AD6A0003D1
8C620001D18C5C0003D1F4200001F178
420003D184200001F0707C0023C8420C
00023 18C5C00023 18A880002B5AD5C00
022A22A200023 1784C0003E2223E0"
620 RETURN
```

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By Dan Nelson

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64K Required for math package & mail merge

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By Tim Nelson

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# RAINBOW Info

## How To Read Rainbow

Please note that all the BASIC program listings you will find in *the Rainbow* are formatted for a 32-character screen — so they will show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, *do* read the text before you start typing.

Finally, the little cassette symbol on listings indicates that program is available through our *Rainbow On Tape* service. An order form for this service is on the insert card bound in the magazine.

RAINBOW
CERTIFICATION
SEAL

## The Rainbow Seal

The Rainbow Certification Seal is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product which carries the Seal has been physically seen by us and that it does, indeed, exist.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to *the Rainbow* for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal. This lets you know that we have seen the product and that it does, indeed, exist.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

There is absolutely no relationship between advertising in *the Rainbow* and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to *any* commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

## Using Machine Language

Machine Language programs are one of the features of *the Rainbow*. There are a number of ways to "get" these programs into memory so that you can operate them.

The easiest way is by using an Editor-Assembler, a program you can purchase from a number of sources.

An editor-assembler allows you to enter mnemonics into your CoCo and then have the editor-assembler assemble them into specific instructions that are understood by the 6809 chip that controls your computer.

When you use an editor-assembler, all you have to do, essentially, is copy the relevant instructions from *the Rainbow's* listing into CoCo.

Another method of getting an assembly language listing into CoCo is called "hand assembly." As the name implies, you do the assembly by hand. This can *sometimes* cause problems when you have to set up an ORIGIN statement or an EQUATE. In short, you have to know something about assembly to hand assemble some programs.

Use the following program if you wish to hand assemble machine language listings:

```
10 CLEAR200,&H3F00:I=&H3F80
20 PRINT “ADDRESS:”;HEX$(I);
30 INPUT “BYTE”;B$
40 POKE I,VAL(“&H”+B$)
50 I=I+1:GOTO 20
```

This program assumes you have a 16K CoCo. If you have 32K, change the &H3F00 in Line 10 to &H7F00.

## What's A CoCo

CoCo is an affectionate name which was first given to the TRS-80 Color Computer by its many fans, users and owners. As such, it is almost a generic term for three computers, all of which are very much alike.

When we use the term CoCo, we refer to the TRS-80 Color Computer, the TDP System-100 Computer and the Dragon-32 Computer. It is easier than using the three "given" names throughout *the Rainbow*.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and TRS-80 Color are, for all purposes, the same computer in a different case, these terms are almost always interchangable.

## Rainbow Check PLUS

The small boxes that you see accompanying programs in the *Rainbow* "Check system," which is designed to help you type in programs accurately.

*Rainbow Check PLUS* will count the number and values of characters you type in. You can then compare the numbers you get to those printed in *the Rainbow*. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use *Rainbow Check PLUS*, type in the program and *CSAVE* it for later use, then type in the command *RUN* and press [ENTER]. Once the program has run, type *NEW* [ENTER] to remove it from the area where the program you're typing in will go.

Now, whenever you press the down arrow key, your CoCo will give you a checksum based on the length and content of the program in memory. This is to check against the numbers printed in *the Rainbow*. If your number is different, check the listing carefully to be sure that you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on page 21 of the February 1984 *Rainbow*.

Since *Rainbow Check PLUS* counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

```
10 CLS.X=256*PEEK(35)+178
20 CLEAR25,X-1
30 X=256*PEEK(35)+178
40 FOR Z=X TOX+77
50 READ Y:W=W+Y:PRINT Z,Y;W
60 POKE Z,Y:NEXT
70 IFW=7985THEN80ELSEPRINT
   “DATA ERROR”:STOP
80 EXEC X:END
90 DATA 182,1,106,167,140,60,134
100 DATA 126,183,1,106,190,1,107
110 DATA 175,140,50,48,140,4,191
120 DATA 1,107,57,129,10,38,38
130 DATA 52,22,79,158,25,230,129
140 DATA 39, 12, 171,128,171,128
150 DATA 230,132,38,250,48,1,32
160 DATA 240,183,2,222,48,140,14
170 DATA 159,166,166,132,28,254
180 DATA 189,173,198,53,22,126,0
190 DATA 0,135,255,134,40,55
200 DATA 51,52,41,0
```

# RAM/ROM Upgrade Roundup

By Ed Ellers

*Rainbow* Technical Assistant

There have been many words written on how to upgrade the various models of the Color Computer and TDP System 100 to get more memory and Extended Color BASIC. With the presence of at least four different versions of the CoCo's main circuit board (each changing various aspects of memory expansion), it's easy to get confused trying to find out how to do the job. At *the Rainbow* editorial office, we've kept a two-page sheet around that tells how to do a number of different mods. When I found out how different the Color Computer 2 was from the earlier models, I decided it was time for an update to put all the upgrade information together in one place.

> *"When I found out how different the Color Computer 2 was from the earlier models, I decided it was time for an update to put all the upgrade information together in one place."*

### What's The Difference?

When Radio Shack first introduced the Color Computer in 1980, it started not with version A, as one might expect, but with a board identified as version D. This circuit board was designed to accept either 4K or 16K of RAM and either 8K or 16K of ROM. The first 8K was for Color BASIC with the second 8K reserved for future use, but by the time the CoCo was actually announced Radio Shack had decided to offer Extended Color BASIC. (Fortunately, they did not repeat the earlier mistake on the Model I where they set up the unit for 4K of ROM and had to go to an extender board for the 12K Level II BASIC.) In 1981 Radio Shack decided to offer the CoCo with 32K RAM; to do it Tandy modified the board to use half of the capacity of a set of 64K RAM chips. Since the modification was rather complex and hard to do in production, they went to the version E board which could accept 4K, 16K or 64K RAMs.

In 1982, as the TDP Electronics division prepared to enter the personal computer market with the System 100, Tandy developed what it calls the NC board (which is often referred to as the 285 or F board). This board was designed to meet slightly relaxed FCC specifications, and used either 16K or 64K RAM chips. The NC board was designed to make available the all-RAM mode that all CoCos had the potential for, but which had not been implemented in the earlier designs. The NC board went into all TDP System 100 units; when Radio Shack dropped the 4K CoCo, the NC board began to appear in their units late that year.

Because the CoCo was priced quite a bit higher than its close competition, Tandy decided to redesign the entire machine into a unit that would cost much less to manufacture. The assignment, making a computer that was much cheaper than the existing CoCo but did exactly the same things, would appear difficult to anyone who is familiar with the CoCo's already efficient design. But the engineers in Fort Worth were able to do it, partly by getting rid of the regulated +12V, -12V and -5V power supplies with the use of new single-supply RAM chips in the 16K models of the new Color Computer 2. This was at about the same time that Radio Shack decided to offer OS-9 and an improved keyboard for the CoCo; the CoCo 2 was initially sold in 16K versions only and the regular CoCo (which was equipped for 64K, but advertised as 32K) was given the new keyboard and a white case and renamed the 64K Color Computer.

If you have a Color Computer with a black border around the keyboard and a RAM size button on top, you have either a D or E board. If you have a CoCo with a gray border around the keyboard and a model number ending in A (or if you have a TDP System 100), you have an NC board; if it has Radio Shack's "32K" RAM then you already have 64K. If you have the Color Computer 2, it's a whole new ballgame.

### A Few Precautions

1) *Unplug the computer* before you start making any of these modifications. Even though the machine is turned off,

there may still be a small current flowing in the CoCo's circuitry, which could cause damage when you start plugging and unplugging chips; there will definitely be 120 volts present on the power transformer, and you could get a very nasty (not to mention dangerous) shock if you make contact with it!

> *"The D and E board upgrades take a bit of wiring to get 64K . . . the NC board is not particularly difficult, and the Color Computer 2 is the easiest of all."*

2) The RAM chips (and, to a lesser extent, the other integrated circuits in the computer) can be damaged by static electricity. The new chips you will be installing will usually be on a black conductive foam pad. Just before you install them, touch the pad to either the shield (if any) over the circuit board or to the RF modulator unit's metal case. (Use the pad to hold the old RAM chips you took out, so they will be protected until you install them in something else.)

3) Use a soldering iron (not a gun) rated at around 40 watts or less. The components and circuit board can take the heat needed for soldering, but the heat of the bigger irons and guns (designed for radio/TV repair work) can easily damage them. A grounded iron (with a three-prong plug) is helpful, but not really necessary; if you have a cordless soldering iron, it would be ideally suited for this work.

## 4K to 16K

To install 16K RAM in a 4K CoCo (D or E board), you need only a set of eight 4116 RAM chips. These should be rated at 200 nanoseconds or faster (which most are these days). When you open the case and remove the shield, you will find the 4K chips in sockets U20-U27. Remove them one at a time by gently prying them out with a small screwdriver or nail file; insert a 16K chip in place of each one, with the notch on one end in the same direction. Now locate two jumpers marked 4K on one side and 16K on the other; one is next to the 6883 SAM chip (U10) and the other is between the two 6821 PIA chips. Change each of them to the 16K position. With Color BASIC, you should now get a response of 14631 to *PRINT MEM*.

## All The Way to 64K

To upgrade a 4K or 16K CoCo to 64K, you will need a set of eight 4164 64K RAM chips, as well as a few feet of thin insulated wire (wire-wrap wire is normally used, but you can also use wire taken out of telephone cable). The D and E board upgrades take a bit of wiring to get 64K (the D version has to be rewired even to get 32K); the NC board is not particularly difficult, and the Color Computer 2 is the easiest of all. On a D or E board, I would first install the chips and get the computer going as a 32K unit before doing the 64K modification. (If you have the D or E board, check the Color BASIC ROM's copyright date; if it's marked (C) '80 you will need to replace it. See BASIC ROM Upgrades below.)

**D Board:** This board has only the two jumpers that I mentioned in the 16K upgrade instructions. After removing the shield cover, check to see that the jumper next to the 6883 SAM chip (marked U10) is in the 16K position and remove the jumper between the two PIA chips. To change the power connections to the RAM chips, bend up pins 1, 8 and 9 of each chip. (With the notched end of the chip facing away from you, pin 1 is at the upper left, pin 8 is at the lower left and pin 9 is on the lower right.) After inserting the RAM chips in place of the old 16K chips, wire pins 1 and 8 of each RAM chip to pin 9 of that chip's socket. Wire the pin 9s on all the chips together and connect them to pin 35 (the sixth pin from the top on the right side) of the SAM chip. Connect pin 12 of U4 to pin 16 of U8. Check to make sure that none of the bent-up pins are touching anything, and that all the pins are well below the edge of the shield wall. (Skip the next paragraph.)

**E Board:** There are five jumpers in this board and two more jumper locations that don't have jumper plugs on them. Move the jumper located between U8 and U4 and the three jumpers next to the keyboard connector to the 32K position, and check to see that the jumper just below C44 is set to the 16K/32K position. Solder the two pins next to C44 together; find the three pins (marked LOW and HIGH) next to U29 and solder the LOW pin to the center pin. Cut off one

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side of each of the capacitors C61, C31, C64, C35, C67, C45, C70 and C48. Replace each of the 16K RAMs with the 64K chips.

With 32K RAM, you should get a response of 31015 to *PRINT MEM* (24871 with Extended Color BASIC). If all is well, unplug the computer again. Pull U29 (74LS02) and U11 (74LS138) from their sockets, bend up pins 4, 5 and 6 of U29 and pin 5 of U11 and reinsert them. Connect pins 6 and 8 of U29 together (pin 8 was not bent up), connect pin 4 of U29 to pin 5 of U11, and connect pin 5 of U29 to the pin marked TP1 on the board. The computer should work the same under BASIC as it did before you took out the two chips. (To try the other half of the RAM, you will need to run some program that uses 64K, such as OS-9 or *Telewriter-64*, and see if it works as expected.)

**Radio Shack 32K:** If your D or E board CoCo was purchased with 32K RAM (or upgraded by Radio Shack), you most likely have a good set of 64K RAMs in place and you will only need to perform the 64K addressing modification above. If the LOW-HIGH jumper (on an E board) is set to HIGH, or if the connections to U4, U8 and/or U10 (on a D board) are different from those given here, you will probably have to put in new 64K chips because the ones you have are good in the high half only. If you put in new RAMs, move the jumper to LOW (on an E board) or change the wiring (on D).

**NC Board:** The RFI shield is held in place by lugs under the board. Pry down the two lugs near the left edge of the board, then pry the shield loose from the top of the board. Clip out capacitors C58, C60, C62, C64, C66, C68, C70 and C72 (these are the nearest of the two capacitors next to each RAM socket). Change the two jumpers next to U21 and one above U28 to the 64K position. Solder the two jumper pins next to U17 together. Replace the 16K RAMs with the 64K chips. When you put the shield back on, bend those tabs you can reach back into place.

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**Color Computer 2:** Unplug the keyboard cable and set the keyboard aside. Replace the 16K RAMs with the new 64K chips. Locate the two adjacent holes at W1 next to the IIA chip (MC6822P) and connect them together. Plug the keyboard back in.

With 64K RAM, you should get a response of 31015 to *PRINT MEM* (24871 with Extended Color BASIC). Unless something very odd is wrong with your machine, the 64K mode should now work. Color Computer 2 users should note that the 16K chips that came out of the CoCo 2 are *not* 4116s; they are 2118s, which use a single +5V power supply and *will not work* in earlier CoCos (either as replacements or for "piggyback" RAM expansion). In the same way, the 4116 RAMs cannot be used in the CoCo 2.

## BASIC ROM Upgrades

**Extended Color BASIC:** The upgrade kit (Radio Shack catalog number 26-3018) consists of the ECB ROM chip and the Going Ahead with Extended Color BASIC manual. Any Radio Shack store or dealer can get it for you, though some sales people may not know that they can sell it without installation or may be unwilling to do it. The only thing you have to do is insert the ROM chip in the empty socket next to the Color BASIC ROM. (ECB does require at least 16K of RAM to operate.)

**Color BASIC Revisions:** Tandy has released three different versions of the Color BASIC ROM, all of which carry the part number 8040364. Version 1.0's major characteristics were that it used a 7-bit format for printer output (and therefore could not use bit-image graphics on Radio Shack printers) and that it worked only with 4K and 16K RAMs (not 64Ks). Version 1.1 (8040364A) allowed the use of 64K RAM chips and used an 8-bit printer format. Version 1.2 (8040364B) cleaned up a few bugs in the Color BASIC math functions, and the extensively rewritten interpreter runs faster than earlier versions did. As with Extended Color BASIC, installing the new ROM only involves putting it in its socket (in this case, replacing the old ROM chip). Socket numbers vary, but the Color BASIC ROM will always be in the lower-numbered position of the two 24-pin sockets (Extended Color BASIC will be in the higher-numbered socket).

## Color Computer 2 Cartridge Port

The Color Computer 2, as mentioned above, uses single-supply 16K and 64K RAMs. Because of this, Tandy left out the regulated +12V supply, which the disk controller and X-Pad depended on for power, so the CoCo 2 normally can't use them (unless you have the Multi-Pak Interface). An unregulated +12V source *is* available, and it's easy enough to put it on the edge connector where it can do some good. Locate the four diodes (CR1-4) next to the power transformer. Run a wire from the cathode (banded end) of either of the two larger diodes (CR3 or CR4) to pin 2 of the edge connector. This pin is clearly marked, and is on the end at the back of the unit.

# Out Of Diversity, An Evolving Curriculum

**By Michael Plog, Ph.D.**
***Rainbow* Contributing Editor**

From time to time, there are little "guideposts" or signs about progress in educational use of computers. One such guidepost is an annual poll of new college freshmen. The survey is conducted jointly by the University of California at Los Angeles (UCLA) and the American Council on Education. Results are based on a statistically adjusted sample of 254,317 freshmen who entered two- and four-year colleges in the fall of 1983.

Among the many topics covered in the poll is one question of interest to us. It seems that 37.5 percent of college freshmen have written a computer program. More males than females have written computer programs, but not as many more as expected: 43.6 percent males compared with 31.6 percent females. Students attending universities tend to have more computer experience than students attending colleges; and those in private colleges and universities tend to have more experience than students in public institutions.

There were many findings contained in the survey. If any of you want to examine the entire survey, you can purchase the results ($8.25 prepaid) from the Cooperative Institutional Research Program, Graduate School of Education, University of California, Los Angeles, Calif., 90024. The question for this month relates less to the number of freshmen programming computers than to what it is they have learned during their high school experience.

Because computer education is relatively new in schools, there is no standard list of educational experiences for students. The curriculum for computer education is still evolving, unlike the curriculum for other subjects in schools.

Most fields of study have a defined area of knowledge that is more or less agreed upon by scholars within the specialty. For example, if students have taken a course in biology, it is reasonable to expect they know about digestion and reproduction. Eating is something common to animals, as is procreation. It is likewise reasonable to expect students completing a course in mathematics to know addition, subtraction, multiplication, and division. A study of arithmetic is simply not complete without such knowledge, and more advanced courses in mathematics have to begin with arithmetic.

In a similar thought, any student who has taken a course in government should know the differences between the Senate and the House of Representatives. Any student who has taken a course in auto repair should know what a spark plug is.

Some fields of study are less well-defined than others. Math and science are traditionally the "hard" sciences, and as such have a more commonly agreed upon set of facts for students to learn. Even in the less well-defined subjects, however, there are some commonalities. I used to be a social studies teacher. Students in my world history classes might have walked away with a different set of facts than those in a class of some other teacher. It is reasonable to expect, however, that a world history or world culture class should contain something on Europe.

Ah, but computer education; that is different from other fields of study. Consider those college and university freshmen who have written a computer program during their high school career. We can make no assumptions about what they learned. It might be fair to assume that most of the students wrote a program on a microcomputer, not a mainframe. Beyond that, there is little that is expected to be common in their educational experiences. We do not even know what a "program" is. My first thought (and possibly yours) is a program in BASIC. However, we might be wrong in that assumption. Some people consider a set of commands for a spreadsheet or data management software to be a "program." It is even conceivable that a student and teacher could consider commanding a word processing system to prepare a set of mailing labels and a personalized form letter as a program.

What we are talking about here is an accepted curriculum for computer education. Not an entire guide to a course, nor lesson plans for teachers, but a commonly approved set of experiences expected of students who have completed a course of study in microcomputers. In all probability, the accepted curriculum will not be available in the near future.

The problem is one of leadership. True, many people and groups are willing to offer leadership to the community of computer educators. There are few educators willing to follow each of the self-appointed leaders. It is hard to be a leader with no followers.

In other fields of education, there are traditional areas of leadership for curriculum development; not so in computer

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*(Michael Plog received his Ph.D. degree from the University of Illinois, the M.S. from Memphis State University, and the B.S. from the University of Tennessee. For his foreign/research language option required for the doctorate, he naturally selected computer language. Michael currently works for the Illinois State Board of Education as a research and evaluation specialist.)*

education. And it appears that some of the traditional places for curriculum leadership are not possible to use for computer education.

First, let's quickly dismiss a few organizations for leadership. The United States Department of Education will be of almost no help in determining curriculum. This organization (and indeed, the rest of the federal government) provides leadership in areas other than curriculum. By targeting funds for specified activities, policy is determined. The federal government can determine that computer education is something important for schools, but cannot provide curriculum suggestions.

The reasons for this are many. The federal people are very careful about local control. After all, those local people vote for the members of Congress. Local control in education is a powerful argument; one which is not easily attacked by federal elected officials. The Department of Education does not provide curriculum leadership in other areas, even mandated fields, such as special education.

State education agencies are probably not the place to look for leadership in curriculum, either. The argument for local control is just as powerful at the state level as it is at the federal level. Also, many state governments do not have people with the expertise to plan curriculum. Leadership from state agencies is generally in areas other than curriculum.

> *"At some time in the future, we will have an accepted curriculum for computer education. Until then, let us enjoy the diversity of creativity that exists now.*

Traditionally, curriculum is determined by a combination of public school teachers, university professors in the field of study, and textbook authors (who tend to be teachers in public schools or universities). The forum for these people to share ideas is typically professional organizations. There are national organizations for teachers in mathematics, science, social studies, and many more narrow fields or disciplines. These organizations have periodicals where experts in the field present views and ideas, sometimes even entire course outlines. The organizations also provide materials to teachers and provide reviews on textbooks.

In all the mainstream disciplines, professional organizations have developed over time, and gradually evolved into positions of leadership for the respective disciplines. Of course, they also had several decades (in some cases, centuries) of past tradition to draw upon. Computer education lacks both the national accepted organization of professionals and the long tradition of what constitutes the field of study.

It is unreasonable to expect educators to agree on the curriculum of computer education quickly. In time, a few authority figures may emerge, and some universities will offer degrees in computer education. National organizations will develop and grow, and eventually one or two will assume the leadership position for curriculum.

Until that happens, however, the subject of teaching about computers will remain a topic somewhat unique to each school. This situation has positive as well as negative points. The negative side is that we, as the public, will not be sure of what knowledge a student has upon completing a course in computers. The positive feature is that experimentation produces possibilities of quality, which can be shared with other educators. After a while, the best of what has been developed can be used by many people, thus sharing good ideas.

There may be no way to speed the process; we may have to let the natural course of events happen, then observe the results. At some time in the future, we will have an accepted curriculum for computer education. Until then, let us enjoy the diversity of creativity that exists now.

I have one additional task this month. I must apologize to you, the reader. In a past article I said that a disk drive in a mainframe establishment contained a googol byte of storage. That is incorrect. The drive has a giga byte, not a googol byte of storage. A giga byte is the number 1 followed by 9 zeros; a googol is the number 1 followed by 100 zeros. Some of you wrote in explaining that it would be impossible to build a machine with a googol byte of storage. So, I have mixed feelings. It is never pleasant to state something in writing that is simply wrong. On the other hand, I do appreciate people reading this column and communicating with me about it. So, thanks for writing to point out the mistake. I am sorry I gave wrong information. I am pleased, however, that you helped me learn something new.

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# REVIVAL

### By Barry E. Becker

*The salvation of a gang of dirty old characters is accomplished by virtue of cleanliness.*

**I had been experiencing a definitely disturbing difference in the definition of the descenders on the lowercase letters on my Gemini 10 printer. The effect was inconsistent, however, and had not been noticeable when the unit was new. So I suspected that something suspicious was afoot with the head.**

**A call to the local authorized service center confirmed that the condition could certainly be caused by a collection of dirt on the print head, and could be cured by carefully cleaning it.**

**The recommended remedy for removal of the residue is isopropyl alcohol, followed by application of a very, very light lubricant.**

**It is necessary to remove the head from the printer first. In the case of the Gemini 10, it is a simple task. Only two screws secure the head in its resting place. After they are removed, the head lifts straight up out of its mount. A flexible, printed circuit cable goes to a connector on a small phenolic board below. A plastic tab on the flexible cable provides a means of grasping the cable and gently pulling it free with a wiggling motion to the right.**

**I went through the cleaning process twice. After the first time, the problem persisted, so I persevered and promptly performed the procedure again. Before the second round, I looked at the business end of the print head with a microscope. Apparently transferring the ink from the ribbon to the head is very tough stuff! A gentle rinse with the alcohol is not sufficient to remove all of the offending material.**

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## SPELL BOMBER

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## SPELLING BEE

The word is pronounced vocally and it is up to you to type in the correct spelling. If wrong, the computer will be your friend and flash the word on the screen for just an instant. OK! Try typing the word in again. STILL WRONG! The computer wants success and allows you to see the word again this time a little longer. If you just can't spell the word, the computer realizes you need to learn to spell the word and leaves the word on the screen for you to copy. Try your best and the computer has a surprise for your reward!

SPELLING BEE I . . . GRADE 1 & 2 SPELLING BEE III . . . GRADE 5 & 6
SPELLING BEE II . . GRADE 3 & 4 SPELLING BEE IV . . .GRADE 7 & 8

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## TC–INVENTORY

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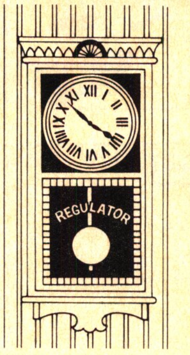
CoCo 32k ECB . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Tape: $16.95

## TEACHING CLOCK



Torn between teaching time on a digital or a conventional (face and hands) clock? Well, this program combines the two using high resolution graphics and prompts! Your child will learn to tell time with the aid of a specially designed CLOCK! Child enters the time, if wrong, the center of the clock displays a graphic aid. If the child is correct a musical reward is heard. Program offers three levels: hours, quarter hours, and five minute intervals.

Apple 48k . . . . . . . . . . . . . . . . . . . . . Disk: $19.95

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The gunk can be removed by applying the alcohol with some force or pressure. A rubber syringe or some similar device should suffice. I used a rubber bulb and teflon tube intended for desoldering. I filled the bulb with alcohol, much like using a huge medicine dropper, and forced it (as briskly as I could) over the face of the print head and into the cavity just behind the face of the head. An ear wash syringe will do just as well.

Make sure that the alcohol does not attack the syringe material! Apply a small amount to the surface of the syringe and wipe it with a white cloth or swab. If any of the color comes off, *do not use it*. You must only use materials that are not attacked by the solvent, otherwise you could really gum-up the works.

Several strong, sloshing rinses are necessary to remove all the gunk. A jeweler's loupe, magnifying glass, or low powered microscope will reveal the condition of the wires directly behind the face of the head. If you can see any globs of ink on the wires inside the cavity behind the head surface, then more washing is necessary. Do not touch or push on the wires. Let the alcohol do the work. Force applied to the wires would probably cause irreparable damage to the print head.

After you are satisfied that the head is really clean, apply a very small amount of a very, very light lubricant. I used something called LPS1, which comes in a spray can. Rather than spraying the head, I recommend collecting a bit of the spray in the cap or a small cup, and applying it to the outer surface and behind the face with a toothpick, *very gently*. You may spray it if you'd rather, but don't saturate it. A little dab'll do ya. Products like WD-40 or CRC 5-56 will probably work just as well. Wipe off the excess from the outside with a clean soft cloth or swab.

Replacing the head on the Gemini is fairly easy. The only caution to observe is in tightening the screws. Do *not* apply a lot of force or you may strip the threads in the mounting holes. Just slightly snug is sufficient. A dab of clear nail polish applied to the screw heads will prevent them from coming loose. Reconnecting the flexible printed circuit cable requires remembering the way it came out, and slipping it back in the connector the same way. A little wiggling and jiggling may be necessary. Be gentle.

The procedure described here is specifically for the Gemini printer. I suspect that most printer heads could be cleaned the same way, but don't take anything for granted. If you think your head could use a cleaning, call the manufacturer or local authorized service center and find out whether it's advisable to clean it yourself, what solvents are acceptable, what lubricants, if any, are acceptable, and what cautions to observe.

Having stated the preceding disclaimers, let me say that the joy is not really in the cleaning, but in the resulting clear, crisp letters that once again pour forth from the print head.

*(Barry Becker, an electrical engineer, has been designing solid-state electronic circuits for more than 20 years. Of his wife and three children, only his youngest son Rob [also a* Rainbow *author] shares his enthusiasm for the CoCo.)*

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*JAN '83

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*JUNE '82

*RAINBOW REVIEW DATES

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## BUMPER STICKERS!! $\$1^{00}$ each

I ♥ My CoCo

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## ATTRACTIVE AUTHORSHIP PROGRAM

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# Watching Important Program Evaluators — The Children

By Fran Saito & Bob Albrecht
*Rainbow* Contributing Editors

"School Is in the Heart of a Child" is for parents of quite young children. We want to help you work and play with your three- to eight-year-old child and learn to use computers as a joyful family experience. We want to suggest ways to incorporate the home computer as another means to encourage your child's independence, growth, and control over his own life. See the pride on her face as she directs the computer to do what she with deliberation selects. See her head gears switch to "on" as she progresses step-by-step with your presence and caring direction.

We will explore (we hope, with *your* help) the following:

- Specific "teaching" techniques so that the discovery can be the child's own.
- Critical evaluation of software based on extensive playtesting in family and related environments.
- Additional resources to consult: books, magazines, software publishers, networks, etc.
- Suggestions for interludes and fun times away from the computer (a must!): call the librarian for specific information; watch a TV program together and discuss it; work together as volunteers in a community project; take a fall (or spring or winter or summer) awareness walk . . .
- Whatever we learn from families we work with in Menlo Park or from you, our readers. Let's pool our knowledge. Let's share our experiences as we all learn from our children.

We will also provide many small programs you can type in and use right now.

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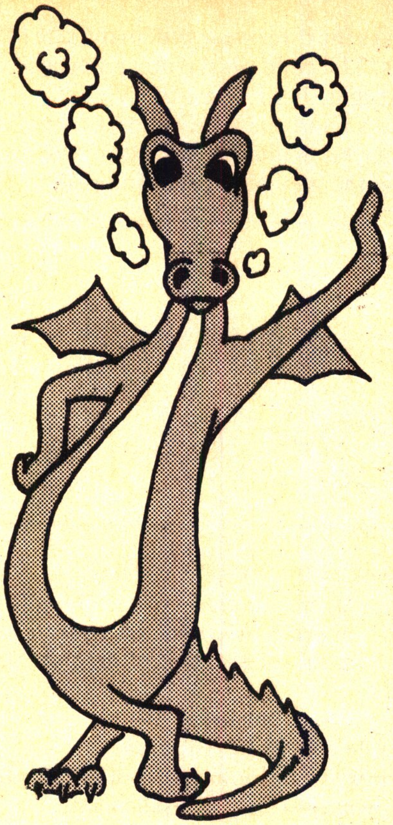
> *Learning is more than just what goes on in a school classroom nine months out of a year. Learning covers all the knowledge and understanding we gain through reading or observing or experiencing. Learning is discovery; learning occurs everywhere. All of us are learning all the time.*
>
> **—Laran Stardrake**

**Long Live RAINBOWfest!**

We have just returned from RAINBOWfest in Long Beach. Eleven members of the Dymax family (The Dragons of Menlo Park) made the pilgrimage and revelled in meeting and talking with people, cruising the exhibit area, learning new stuff. Kudos to Lonnie and everyone for a great convention — it reminded us of the first days of the West Coast Computer Faire when things were still new and brightly shining. Long Live RAINBOWfest! We'll be back.

*(Fran Saito holds a degree in education from the University of Hawaii and has taught preschool and elementary students. She feels her inspiration comes from Mariko, her five-year-old daughter. Well-known author Bob Albrecht also writes the "GameMaster's Apprentice" feature for* the Rainbow *each month.)*



**DragonSmoke**

We suggest you read "Intelligent Schoolhouse: Readings on Computers & Learning," edited by Dale Peterson. From Reston Publishing Company, 11480 Sunset Hills Road, Reston, VA 44090. A rich compendium of essays written by people in schools and outside of schools. Here is a small selection of contents pertinent to "School Is in the Heart of a Child."

"Computer as Mudpie" — Seymour Papert
"The World's Most Expensive Flash Card" — Herbert Kohl
"The Pedagogy of Games" — Ramon Zamora
"Computer Literacy: The What, Why, and How" — Arthur Luehrmann
"What Makes Computer Games Fun? Guidelines for Designing Educational Computer Programs" — Thomas W. Malone
"Computers in Public Places" — Ann White Lewin
"A Computer in the Nursery School" — Ann McCormick Piestrup
"Special Help for Special Children: Carl, Mrs. Brown, and the Computer" — Mary M. Humphrey & Glenn M. Kleiman
"Computers and the Autistic Child" — Richard E. Frost

Lots of folks believe LOGO is better than BASIC as a kid's first computer language, especially for younger kids. We agree. Next time, we will include some introductory material on "CoCo LOGO," or "Color LOGO" as Radio Shack calls it. In the meantime, we suggest you hurry on down to your friendly Radio Shack store and get a copy of Color LOGO (Program Pak or disk) and the following booklets.

"Color LOGO Guide for Teachers: Book One" (Cat. No. 26-2761) by Don Inman & Bob Albrecht.
"Color LOGO Guide for Parents: Book One" (Cat. No. 26-2763) by Ramon Zamora & Bob Albrecht.

If you join the LOGO revolution, also join the Young People's LOGO Association, 1208 Hillsdale Drive, Richardson, TX 75081.

We have a small roll-around bookcase containing books, magazines, and other resources we frequently consult for information and inspiration when we write for parents and kids. For a current list of things we like, send a self-addressed, stamped envelope to DragonSmoke, P.O. Box 310, Menlo Park, CA 94026.

**Join The Koala Krusade!**

We have been playing with Koala Pads on ATARI computers and watching kids become entranced with this delightful touch pad. We are convinced that touch pads such as the Koala Pad are a major break through in using computers —especially for younger kids. Alas — you can buy Koala Pads for Apple, ATARI, Commodore 64, and IBM PC — but not for the CoCo. Hmmm . . . suppose multitudes of us implored Koala Technology to make a CoCo version? We volunteer to be a clearing house and collect entreaties for a CoCo Koala Pad. If you would like to have a Koala Pad for your CoCo, please send us your requests. We will collect and send or deliver them to the people at Koala. Send your entreaty to:

- Koala Krusade, P.O. Box 310, Menlo Park, CA 94026

If you want to contact Koala directly, write to:

- Koala Technologies Corporation, 3100 Patrick Henry Dr., Santa Clara, CA 95050

**Playtesting, First Impressions**

ComputerKid, USA! puts computers in the hands of kids in youth organizations, alternative schools, and at home in order to playtest and evaluate educational software in places that are *learner-centered*, instead of *teacher-centered*. We now have the following sites.

— Herbert Hoover Boys' Club in East Menlo Park, California. Boys and girls of many ages.
— Greenoaks Montessori School in Menlo Park. Kids from three to six years old.
— Our own playtest room. Kids and their parents come after school to try out educational software.
— Greene Community School, Greene, Iowa. A CoCo in the elementary school library can be checked out for home use. Greene is a rural community of about 1300 people.
— Roving CoCos on loan to Menlo Park families who will playtest software and report on their experiences.
— Roving software on loan to Menlo Park families who have their own CoCos.

Tim Finger is Director of ComputerKid, USA! He has been doing this full-time for two years. He begins by trying programs himself to get the "feel" of the software. Then, he uses the programs with a bunch of kids and learns more by watching them. Finally, the software goes to other playtest supervisors who work with kids and fill out formal evaluation forms. Below is the story of Tim's first playtest of some items from Radio Shack.

- *Star Trap* (RS Cat. No. 26-2510 . . . $19.95)
- *Grobot* (RS Cat. No. 26-2527 . . . $19.95)
- *Ernie's Magic Shapes* (RS Cat. No. 26-2524 . . . $19.95)
- *X-PAD* (RS Cat. No. 26-1196 . . . $99.95)

Jan. 30, 1984. Greenoaks Montessori School. Age: five.

The room is buzzing today when Tim walks in. There are two nurses dressed in their white uniforms, circulating in the classroom and asking questions of the children. The children think it's pretty neat and are very excited. So excited that it's difficult to calm down when Tim is ready for his first group and his first game, *Star Trap*. The object is to trap a shooting star that is speeding through a maze. The game is directed to ages seven and older, but part of Tim's purpose is to see what games can be effectively used by parent and young child together. Can the age level be brought down because parent is working with child? The game depends on manipulation of the joystick. This group of five-year-olds likes the idea of the game, to capture the evasive star, but they have little control over the joystick. The right and left movements they have practiced become totally confused when the game requires that they be quick and automatic. The movement goes too quickly for them.

Tim: There is too much play in this joystick and the responses are slow, sluggish. Another thing I look at are the color graphics. Is there variation in color? Is it pleasing to the eye? For this game, I would say no.

I see possibilities for this game, though. For the child who has more control over the joystick there could be some benefits: he/she could learn to anticipate movements, to think ahead and could become quite creative in setting up blocks.

*Grobot* is the second game Tim sets up. This time he has two small helpers who have learned to put the cassette in the tape recorder and to rewind. They all are slowly on their way to being in control of setting up the computer; Tim is pleased with their progress.

*Grobot* is directed to children 10 and older and is about growing plants in different climates.

Here again the children like the idea of the game and seeing the plants grow and flower, but for them there are too many things to watch for and control: pests from above and below, flowers to be plucked quickly, decisions to be made by choosing from too many selections.

The names for the plants look and sound strange to Tim. Bagalabra. Twiskis. Kalidobean. "Why," wonders Tim, "aren't real plants used with their real names and characteristics?" Like tulip. Maple. Coconut tree. Would the children relate more to those names and the concept of ideal habitats for different plants?

**Feb. 7, 1984. Greenoaks. Age: three.**

Tim and his helper, Sheri, have been frustrated in the preparation of this game. Directions in the manual for the set-up are not precise and they learn, after much effort has been expended to no avail, that this drawing pad works only on the older model CoCo. (This is the *X-Pad*. It does not work on the CoCo2 unless you add the multipak interface or slightly modify the CoCo 2. We expect the *X-Pad* will be discontinued in favor of a touch pad more like the Koala Pad.)

this drawing pad, has to be very accurate. Lots of picture-perfect graphics would be very welcome.

Tim: Who can type in the letter R?

David quickly seeks and presses. The letter R appears on the screen. David is almost four years old and is the hotshot of the group. He understands the directions easily and responds accurately. He finds U, then N and the [ENTER] key.

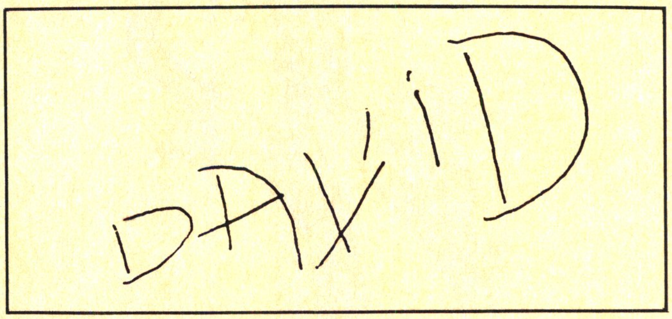
Ready to go, the drawing pad only awaits a drawer.

Tim: Would you like to try?

He asks the three-year-old on the side of him. The child declines. The child on the other side also declines.

Tim: Alright. *Who* wants to try this?

David's hand shoots up and he comes over. Carefully he prints his name on the clean white sheet of paper covering the grey metal drawing pad.



Tim: Look at the TV screen, David.

A smile of satisfaction crosses David's face as he sees his name, in rainbow colors, on the screen.

Now Tim draws a circle and straight lines emanating from it.

"What is this?" he asks.

"A sun!" chorus the children.

He draws what looks like a building within the sun.

"And what is this?" he asks again.

"A house," they say.

"Have you ever seen a house in the sun?"

One child nods with surety. That's David. Most do not respond. One or two look questioningly at Tim. Tim only grins.

He erases the screen and then draws four circles one on top of each other, the largest circle on the bottom, the smallest at the top.

Tim: "What is this?"

Children: "A snowman."

Tim: "That's a funny-looking snowman. Is he missing something?"

Children: "A hat. Arms. Hands."

Together he and the children complete their snowman and while Tim laughs at the lopsided figure, the children don't find it lopsided at all. That's the way Frosty is supposed to look, their expressions say.

In like manner, the little group goes through filling in parts of a car. It ends up finally a fire engine. Tim now asks, waving the pen, "Who would like to try this?"

He asks Ria. She says that she would, but that she'll need some help. Tim nods and hands her the pen. Ria discovers that unless she presses down with the pen hard enough, her mark doesn't appear on the screen, although it does appear on the paper. So she concentrates on pressing down harder and sure enough, her name, too, appears on the screen. She is pleased at her name in rainbow colors.

Everyone, teachers and children, likes this drawing pad concept. Join the Koala Krusade! The possibilities are infinite for young child and parent to create a picture together. The patterns lend themselves toward beautiful abstract designs and the rainbow colors are very pleasing to the eye. No one needs to be an artist, as everything looks good.

In short, this is a creative, fun activity. It is something that can be used repeatedly with new inspiration. It encourages development of another level of perceiving — what I draw on this paper appears simultaneously on the screen. While

# the RAINBOW's

# ADVENTURE CONTEST

Enter your Adventure program in the Rainbow's Adventure Contest! You will have the chance to win valuable prizes and to share your Adventure with thousands of Color Computer, TDP-100 and Dragon-32 owners worldwide.

## Just look at all these prizes . . .

**For our winner:**

An Amdisk-III 3" microfloppy dual drive valued at $499 and a J&M controller worth $150, from Amdek.
Plus, any five programs (tape or disk), a $95 value from Shell Software.
Plus, a WICO adapter and two Red Ball joysticks, an $89.95 package from S & S Arcade Supplies.

**For our runner-up:**

The USI 1400/c 14" color monitor with sound and one double driver interface, a $425 package from JARB Software.
Plus, a WICO adapter and two Quick Shot joysticks, a $59.85 package from S & S Arcade Supplies.
Plus, any three programs, a $57 value from Shell Software.

**For third place:**

A Color I+ 13" color monitor with nonglare screen and audio headphone jack, worth $399 from Amdek.
Plus, any two programs, a $40 value from Shell Software.
Plus, a WICO adapter worth $19.95 from S & S Arcade Supplies.

## And these special awards:

| | |
|---|---|
| A Disk Drive and Controller | the Rainbow |
| $400 gift certificate toward the purchase of software and two T-shirts | Microware |
| Complete VIP Library worth $320 | Softlaw Corporation |
| Banana Printer with cable worth $269.95 | Delker Electronics |
| $250 gift certificate toward the purchase of software | Prickly-Pear Software |
| Surprise Package, $149.95 | PBH Computer Products, Inc. |
| BCM 12" Monochrome Monitor, $105 | Computer Plus |
| $100 gift certificate toward the purchase of software | Computerware |
| Color Computer FLEX with DBASIC Software, $99.95 | Frank Hogg Laboratory |
| $75 gift certificate toward the purchase of software | Computer Island |
| One complete copy of the Homebase Computer System, $75 | Homebase Systems |
| Super Pro Keyboard, $69.95 | Mark Data Products |
| Real Talker, $59.95 | Colorware Inc. |
| $50 software certificate | Spectrum Projects |
| Super Backup Utilities, $49.95 | Computize Inc. |
| Hayes Computer Controller Joystick, $44.95 | MichTron |
| Disk or cassette version of *Revolution*, $19.95 | Inter+Action |

**RULES:** All programs must be original works, no "conversions." Entries must be postmarked by May 1 and become the property of Falsoft, Inc., publisher of *the Rainbow*. Decision of the judges is final. Duplicate prizes will be awarded in the case of ties. Winning programs to be featured in a special *Rainbow* Adventure issue. Mark entries "Adventure Contest Editor" and send to *the Rainbow*, P.O. Box 209, Prospect, KY 40059.

initially the concentration is wholly on the paper image, soon the child, while drawing, looks to the screen for direct feedback. (Excellent preparation for Apple's MacIntosh and other ICON/WINDOW computers of the future.)

Drawbacks: Cost is high — $199. Putting in this program is not that simple for beginners. While our three-year-old needed practice in holding the pen and pressing down hard enough, we note that the pad, according to directions, can be programmed so that only movement of the pen is sufficient to produce effect.

**Feb. 13. Greenoaks. Ages: five through six.**

Much to his dismay, *CoCohead* by Computer Island does not work with the equipment on hand today, so Tim dregs up *Ernie's Magic Shapes* again. (We will try *CoCohead* another time.)

The testing with a giggly group of four young lads brought up the reality of black and white TVs. Not only was it less vivid and beautiful but the games involving color perception, of course, do not work (in this case, more than half of the game choices). For how many people, schools, or centers out there is this a problem? Is it something that should be brought to the attention of software people?

The four boys do the game very well. In fact, the challenge and excitement seem to be lacking. Have they tired of this game? At this age level, has it no more appeal after they have done it a couple of times?

Florence, in the second group of children, says, "I've seen enough of Ernie, Tim. Let's play something else."

For some of these children, then, the game has already lost its appeal. For home use, a program must have "staying power" in order to justify its purchase. Does *Ernie's Magic Shapes* have staying power? We don't know yet — what do you think?

**Help!**

Help us playtest and evaluate CoCo software. Send us a stamped, self-addressed envelope and we will send you a bunch of playtest evaluation forms and directions on how to use them. Fran & Bob, P.O. Box 310, Menlo Park, CA 94026.

**Wordsworth**

Assign a number score (LS) to each letter of the alphabet, A through Z, as follows:

A=1
B=2
C=3
D=4
E=5
F=6
G=7
H=8
I=9
J=10
K=11
L=12
M=13
N=14
O=15
P=16
Q=17
R=18
S=19
T=20
U=21
V=22
W=23
X=24
Y=25
Z=26

A word's worth (Wordsworth) is its numerical value, obtained by adding the values of the letters in the word. For example:

HOBBIT is worth 8+15+2+2+9+20 = 56 points
DRAGON is worth 4+18+1+7+15+14 = 59 points
TROLL is worth 20+18+15+12+12 = 77 points

From now on, for quite some time, we will suggest Wordsworth activities for you and your child. So . . . we must select a dictionary. We choose the following:

■ "THE SESAME STREET DICTIONARY." Random House/Children's Television Workshop.

Get it at your friendly local book store. If they don't have it, call Random House toll free: 800-638-6480. Ask for Customer Service.

We will send a small stuffed dragon to the first child (earliest postmark), age three to eight, who sends us the answers to the following questions. *All answers must be bold face words in "THE SESAME STREET DICTIONARY."*

1) What three-letter word has the smallest Wordsworth?

__________________

2) What three-letter word has the largest Wordsworth?

__________________

3) What four-letter word has the smallest Wordsworth?

__________________

4) What four letter word has the largest Wordsworth?

__________________

5) What is the first word (alphabetically) to have a Wordsworth of exactly 100? __________________

6) In the entire dictionary, what word has the largest Wordsworth? __________________

7) What is the longest word (most letters) having a Wordsworth of exactly 100? __________________

We hope that parents and children have a wonderful time browsing through "THE SESAME STREET DICTIONARY."

Most of the work and play in answering our Wordsworth challenge is *people work*: browsing a dictionary, thinking about the questions, creating strategies — most enjoyable! People are well equipped to do this kind of work/play.

Some of the work is grungy stuff: looking up letter scores, adding numbers.

Hmmm . . . why not let CoCo do some of the grungy stuff? Here is our first Wordsworth program.

I want a good home.

```
100 REM**WORDSWORTH #1 SCH 4-1
110 CLS
200 REM**ASK FOR A WORD
210 PRINT
220 INPUT "YOUR WORD"; WRD$
300 REM**WL IS LENGTH OF WORD
310 WL = LEN(WRD$)
400 REM**START WORDSWORTH AT 0
410 WW = 0
500 REM**COMPUTE WORDSWORTH
510 FOR L=1 TO WL
```

(cont.)

```
520 : L$ = MID$(WRD$,L,1)
530 : IF ASC(L$)<65 THEN 570
540 : IF ASC(L$)>90 THEN 570
550 : LS = ASC(L$) - 64
560 WW = WW + LS
570 NEXT L
600 REM**PRINT THE WORDSWORTH
610 PRINT "THE WORDSWORTH IS" WW
700 REM**GO FOR ANOTHER WORD
710 GOTO 210
```

**Look For Words**

This program fills the screen with random letters. Can you find words on the screen? Write down any words you find. When in doubt, consult a dictionary.

```
100 REM**RANDOM LETTERS SCH 4-2
110 C$="BCDFGHJKLMNPQRSTVWXYZ"
120 V$="AEIOU"
130 PV=30
200 REM**PUT LETTERS ON SCREEN
210 CLS
220 FOR SP=0 TO 447
230 : GOSUB 910 'PICK A LETTER
240 : PRINT @SP, L$;
250 NEXT SP
```

(cont.)

```
300 REM**TELL HOW TO DO AGAIN
310 PRINT @480,"FOR MORE LETTERS
, PRESS SPACE";
320 K$=INKEY$:IF K$="" THEN 320
330 IF K$=" " THEN 210 ELSE 320
900 REM**PICK A LETTER SUBR.
910 R = RND(100)
920 IF R<=PV THEN 930 ELSE 950
930 L = RND(5)
940 L$ = MID$(V$,L,1): RETURN
950 L = RND(21)
960 L$ = MID$(C$,L,1): RETURN
```

The subroutine in block 900 picks a letter (L$). Lines 910 and 920 decide whether to pick a vowel or a consonant. In line 130, we set the probability of picking a vowel (PV) at 30 percent. In line 910, the value of R can be any number from 1 to 100. If R is less than or equal to PV (line 920), the CoCo will pick a vowel in lines 930 and 940. However, if R is greater than PV, the CoCo will pick a consonant in lines 950 and 960. You can change the probability of getting a vowel by changing the value of PV in line 130. Happy word hunting!

**Help!**

If your home has a kid, three to eight years old, and a CoCo, please share your experiences in using your CoCo with your child. If you write to us, please tell us if it is OK to print all or part of your letter in this column. Fran and Bob, P.O. Box 310, Menlo Park, CA 94026.

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# BOLTYPE

By Mike Fahy

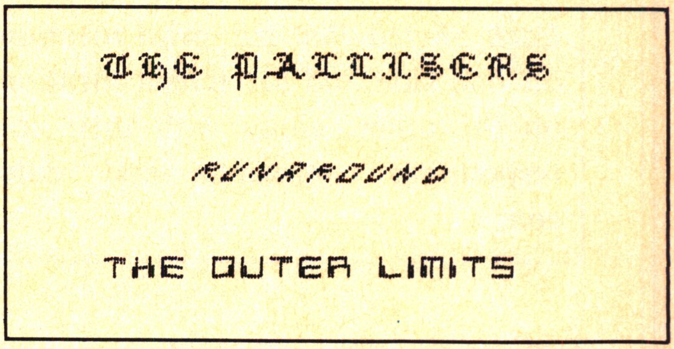
## *A tutorial on the use of dot graphics*

A very interesting feature of most printers is their ability to use dot graphics. Unfortunately, this capability is not used or understood by most owners of printers, such as the Line Printer VII or DMP-100. Sure, there are a few graphic screen dump programs around, but it seems that we should be able to do more than just copy what is already on our screen. I suppose the main reason for the lack of this type of program is the fact that it is difficult to find anything that discusses dot graphics in a way that a person who is unfamiliar with the subject can understand.

*BOLTYPE* is a 32K Extended Color BASIC program that allows your Line Printer VII or equivalent to print with three new styles: Old English, Italics, and the Futuristic type. To use *BOLTYPE*, simply type or load it in and *RUN*. For those wishing to modify the program to their own tastes, I have supplied a detailed line description. If, for some reason, you don't want to type in the tedious *DATA* statements, you may send a blank cassette, self-addressed double-stamped envelope, and $4 to Mike Fahy, P.O. Box 943, Havelock, NC 28532.

Before running, make sure the printer is turned on, or the program will "hang-up" in line 60 until it is. Also, make sure the switch on the rear right-hand side of your printer is set to 8BS if you are using a Line Printer VII. This allows the printer to receive eight bits rather than the usual seven. The eighth bit is essential in order for the printer to recognize graphics characters (more on this later).

After all of the data in lines 220-1250 have been read by lines 110-190, the program will display the menu page, which begins at 1450. By selecting A, B, or C, you may choose which type style you desire. Then you will be asked what you would like to have printed. After entering your message, the program will print your message to the printer in the style which you requested.



THE PALLISERS

RUNAROUND

THE OUTER LIMITS

While in the Italic or Futuristic mode, the program will use the standard characters for any punctuation or numerals you enter. By using the lowercase mode, you can combine standard characters with the new style. For instance, by entering *BOLTYPE by mike fahy*, the printer will type *BOLTYPE* in the desired type and "BY MIKE FAHY" in standard uppercase letters. This does not work while using Old English, however. In this mode, there is no support of any special characters or numerals.

Exactly how does this program work? On Page 15 of the Line Printer VII reference manual, it is explained that in order to use the graphics mode of the printer, you must first enter the mode by typing *PRINT#-2, CHR$(18)*, which is done in line 100 of this program.

The codes for the graphics patterns are stored in decimal 128 to 255. In other words, printing any characters less than 128 while in the graphics mode will not show any results except for the control codes described on Page 11 of the reference manual. The reason for this is because the most significant bit (MSB), which is the first bit in a graphics character, has to be 1. The remaining seven bits correspond to the seven dots which form one column. The least signifi-

---

*(Mike Fahy is a student at West Carteret High School in Morehead City, N.C., and has been interested in computing for three years. He hopes to meet more people his age who are also serious about programming.)*

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cant bit (LSB) is the top dot, followed by the next-to-least significant bit . . . until you reach the second-most significant bit, which controls the bottom dot. If the corresponding bit is a 1, the dot is printed.

Lost? Well, if you look on Page 184 of the *Going Ahead With Extended Color BASIC* manual, you will find a table titled "Base Conversions." It's probably the one you can't figure out what to do with. In the second column, labeled "Binary," you will find what seems to be a mad jumble of ones and zeros. Actually, these "numbers" represent how the computer counts. For instance, the decimal value of 128 is also the binary value of 10000000. The decimal of 223 is binary 11011111.

So, what does that have to do with anything? Actually, it has everything to do with it. Okay, let's take a look at a broken down byte code.

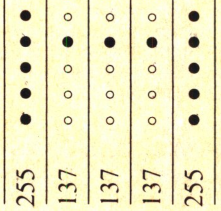
Decimal 171 equals 10101011. The first or most significant bit is 1, so we know that it is a graphics character. The last or least significant bit is also 1, which means the topmost dot is printed. The next to least significant bit is 1 too, meaning the next to the top dot is printed. But the next bit is a 0, so the third dot is not printed. This process is repeated until it gets to the next to most significant bit, which is a 0. Therefore, 171 would look something like this:

| | | |
|---|---|---|
| LSB | 1 | ● |
| 7th | 1 | ● |
| 6th | 0 | ○ |
| 5th | 1 | ● |
| 4th | 0 | ○ |
| 3rd | 1 | ● |
| 2nd | 0 | ○ |
| MSB | 1 | ● |

So, while in the graphics mode, if you told the printer to print character 171, it would print something like "⁝".

Note: The MSB will not be printed since it is merely to determine whether or not the character is a graphics character or not.

Fine. So now that I know how to get a certain graphics character, how do I make my own characters? This is the simple part. Well, at least it's easier than the rest of our procedure. To make your own characters, simply combine the characters you already have. For instance, to make an A, you could combine decimal 255, which is binary 11111111, with three 137s, which have binary values of 10001001, and a second 255, to make something like:



And that just about wraps it up for the development of the characters. Now, let's take a look at the line descriptions I mentioned earlier:

| **Line #** | | **Description** |
|---|---|---|
| 50 | – | Displays title |
| 60 | – | Checks to see if printer is ready |
| 90 | – | Clear string space and set up arrays |
| 100 | – | Enter dot graphics mode |
| 110-169 | – | Read Old English data |
| 170-190 | – | Read Italics data |
| 200-210 | – | Read Futuristic data |
| 220-730 | – | Data for Old English |
| 740-990 | – | Data for Italics |
| 1000-1250 | – | Data for Futuristic |
| 1280 | – | Clear screen and ask for message (Italics) |
| 1290-1400 | – | Convert characters to graphics, check for special characters and print |
| 1410-1420 | – | Carriage return and skip one line |
| 1460-1520 | – | Menu |
| 1530-1560 | – | Clear screen and ask for message (Old English) |
| 1570-1660 | – | Convert characters to graphics and print one at a time |
| 1680-1700 | – | Clear screen and ask for message (Futuristic) |
| 1710-1830 | – | Convert characters, print and check for special characters |
| 1840 | – | Carriage return and skip one line, return to menu |

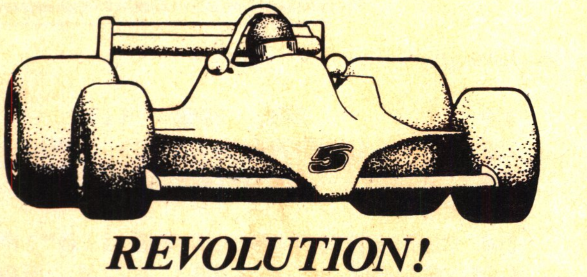
If there is still some confusion about using dot graphics or the program, please feel free to call me at (919) 247-3037 after 5 p.m. EST, or write to me at the aforementioned address. Good luck!

| | | | |
|---|---|---|---|
| 220 | 144 | 1050 | 150 |
| 390 | 75 | 1200 | 61 |
| 540 | 125 | 1460 | 188 |
| 720 | 12 | 1620 | 249 |
| 860 | 29 | END | 164 |

**The listing:**

```
10 '        BOLTYPE  1.0
20 '      COPYRIGHT (C) 1983
30 '        BY MIKE FAHY
40 '
50 CLS:PRINT"BOLTYPE 1.0":PRINT"
COPYRIGHT (C) 1983 BY M. FAHY"
60 IF PEEK(&HFF22)<>4THENPRINT@2
30,"PRINTER NOT READY...":GOTO60
70 PRINT@230,"ONE MOMENT PLEASE.
.."
90 CLEAR1000:H=0:DIMOE$(26,2),C(
26,9),F(26,9)
100 PRINT#-2,CHR$(18)
110 FORFI=1TO26
120 FORSL=1TO2
130 READA:IFA=-1THEN160
140 OE$(FI,SL)=OE$(FI,SL)+CHR$(A
)
150 GOTO130
160 NEXTSL,FI
170 FORX=1TO26:FORY=1TO9
180 READC(X,Y)
190 NEXTY,X
200 FORX=1TO8:FORY=1TO9:READF(X,
Y):NEXTY,X:FORY=1TO4:READF(9,Y):
NEXTY
210 FORX=10TO26:FORY=1TO9:READF(
X,Y):NEXTY,X
220 DATA 128,128,128,130,129,229
,185,166,191,240,128,128,128,-1
230 DATA 130,129,129,129,131,130
,128,128,128,129,131,130,129,-1
240 DATA 130,129,145,254,128,254
,137,137,142,240,-1
250 DATA 128,130,129,129,129,130
,130,130,129,128,-1
260 DATA 144,252,130,253,129,129
,130,130,192,-1
270 DATA 128,128,129,130,130,130
,130,129,128,-1
280 DATA 128,130,146,250,133,249
,129,130,252,-1
290 DATA 130,129,129,131,130
,130,129,128,-1
300 DATA 144,252,130,253,145,145
,162,130,192,-1
310 DATA 128,128,129,130,130,130
,130,129,128,-1
320 DATA 128,128,130,129,145,254
,128,254,145,130,130,129,-1
330 DATA 130,129,129,129,131,130
,130,128,128,128,128,128,-1
340 DATA 144,252,130,192,190,145
,138,138,241,-1
350 DATA 128,128,129,132,132,132
,132,129,129,-1
360 DATA 130,145,253,130,254,145
,137,144,224,-1
370 DATA 128,130,129,129,130,130
,161,144,143,-1
380 DATA 130,129,145,254,128,254
,129,129,130,-1
390 DATA 129,130,130,129,128,129
,130,130,129,-1
400 DATA 128,130,129,145,254,129
,254,129,-1
410 DATA 130,129,129,131,130,130
,129,128,-1
420 DATA 130,145,189,130,254,145
,177,178,208,-1
430 DATA 130,129,129,131,130,130
,128,129,130,-1
440 DATA 130,145,189,130,254,129
,129,130,128,-1
450 DATA 128,130,129,129,129,131
,130,130,129,-1
460 DATA 130,145,254,129,145,254
,146,253,129,129,254,128,128,-1
470 DATA 128,130,129,128,130,129
,128,129,130,128,129,130,129,-1
480 DATA 130,145,255,130,253,129
,129,254,145,128,-1
```

SOFTWARE FOR THE TRS-80* COLOR COMPUTER!



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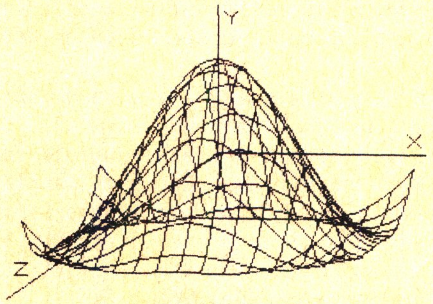

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```
490 DATA 128,130,129,128,129,130
,128,129,130,129,-1
500 DATA 144,252,130,160,158,129
,253,130,252,-1
510 DATA 128,128,129,130,130,130
,130,129,128,-1
520 DATA 130,145,254,130,253,129
,129,254,-1
530 DATA 130,129,191,129,130,130
,130,139,-1
540 DATA 144,252,130,160,158,129
,253,130,252,128,-1
550 DATA 128,128,129,130,130,130
,130,129,130,130,-1
560 DATA 130,145,254,130,253,145
,145,238,128,128,-1
570 DATA 128,130,129,128,129,130
,128,129,130,129,-1
580 DATA 128,150,169,169,169,170
,145,224,-1
590 DATA 130,129,129,129,130,130
,129,128,-1
600 DATA 130,145,249,133,129,190
,130,254,129,192,-1
610 DATA 128,128,128,129,130,130
,130,130,129,128,-1
620 DATA 145,254,128,128,254,129
,254,129,128,-1
630 DATA 130,129,130,130,130,129
,131,130,129,-1
640 DATA 130,145,254,128,254,128
,129,254,129,-1
650 DATA 128,128,129,130,130,130
,129,129,128,-1
660 DATA 130,145,254,128,128,254
,145,254,144,128,129,255,-1
670 DATA 128,128,129,130,130,130
,129,129,130,130,129,128,-1
680 DATA 194,129,145,146,252,146
,145,129,194,-1
690 DATA 129,130,130,129,128,129
,130,130,129,-1
700 DATA 130,145,254,128,128,254
,129,254,129,-1
710 DATA 162,145,146,162,162,161
,147,140,128,-1
720 DATA 130,129,193,161,145,138
,134,162,145,144,224,-1
730 DATA 130,129,129,129,129,130
,130,130,130,129,128,-1
740 DATA 192,160,144,216,180,146
,138,134,130
750 DATA 192,224,208,216,212,210
,178,138,132
760 DATA 192,224,208,200,196,130
,130,130,130
770 DATA 192,224,208,200,164,162
,146,140,128
```

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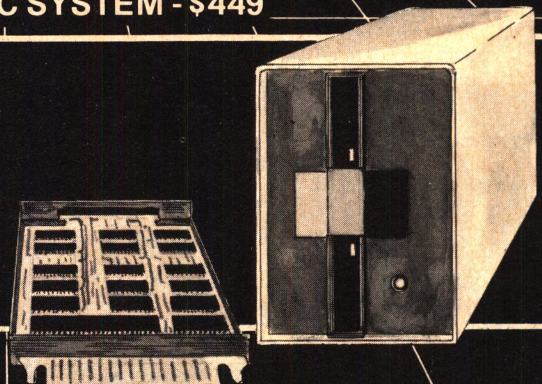

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```
780 DATA 192,224,208,200,140,138
,130,130,130
790 DATA 192,160,144,136,140,138
,130,130,130
800 DATA 192,224,208,200,164,146
,146,130,130
810 DATA 192,160,144,200,172,154
,136,132,130
820 DATA 192,192,224,208,138,134
,130,130,128
830 DATA 192,224,208,192,160,144
,136,132,130
840 DATA 192,160,144,184,212,146
,136,132,130
850 DATA 192,224,208,200,196,194
,128,128,128
860 DATA 192,160,144,136,132,222
,168,148,142
870 DATA 160,144,136,244,174,144
,136,132,130
880 DATA 192,224,208,200,196,162
,146,138,134
890 DATA 192,160,144,136,140,138
,138,138,132
900 DATA 192,224,208,200,162,178
,202,134,130
910 DATA 192,160,144,136,156,170
,202,138,132
920 DATA 192,192,192,200,172,154
,138,130,130
930 DATA 128,192,162,146,138,134
,130,130,130
940 DATA 192,224,208,200,164,146
,136,132,130
950 DATA 192,176,172,162,144,136
,132,130,128
960 DATA 192,224,208,200,210,200
,160,144,142
970 DATA 192,160,160,158,176,144
,132,130,128
980 DATA 200,172,154,136,136,132
,130,5,5
990 DATA 192,224,208,210,202,138
,134,130,128
1000 DATA 248,255,137,137,137,25
5,248,128,128
1010 DATA 255,201,201,201,201,25
5,248,128,128
1020 DATA 255,193,193,193,193,19
5,227,128,128
1030 DATA 255,249,193,193,193,19
3,190,128,128
1040 DATA 255,249,201,201,201,20
1,201,128,128
1050 DATA 255,249,137,137,137,13
7,137,128,128
1060 DATA 255,249,193,193,201,20
1,251,128,128
1070 DATA 248,255,136,136,136,25
5,248,128,128
1080 DATA 255,248,128,128
1090 DATA 248,248,192,192,192,19
2,255,128,128
1100 DATA 255,248,140,138,138,13
7,249,128,128
1110 DATA 255,248,192,192,192,19
2,192,128,128
1120 DATA 255,249,129,255,129,12
9,255,128,128
1130 DATA 255,250,132,136,144,16
0,255,128,128
1140 DATA 255,193,193,193,193,24
9,255,128,128
1150 DATA 255,249,137,137,137,13
7,143,128,128
1160 DATA 255,249,193,208,255,16
0,192,128,128
1170 DATA 255,249,137,137,137,14
3,248,128,128
1180 DATA 207,201,201,201,201,20
1,249,128,128
1190 DATA 129,129,129,255,131,13
1,131,128,128
1200 DATA 255,248,192,192,192,19
2,255,128,128
1210 DATA 143,159,160,192,160,14
4,143,128,128
1220 DATA 255,248,192,255,192,19
2,255,128,128
```

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```
1230 DATA 247,248,136,136,136,13
6,247,128,128
1240 DATA 143,136,136,248,248,13
6,143,128,128
1250 DATA 193,225,209,201,197,19
5,193,128,128
1270 GOTO1450
1280 PRINT#-2,CHR$(18);:CLS0:PRI
NT@491,"italics";:PRINT@0,"";:LI
NEINPUT"message";A$
1290 L=LEN(A$)
1300 FORLL=1TO L
1320 M$=MID$(A$,LL,1)
1330 O=ASC(M$):A=O-64
1340 IF O>96 AND O<123 THEN PRIN
T#-2,CHR$(30);CHR$(O-32);CHR$(18
);:HH=HH+1:IFLL>=L THEN1840ELSEN
EXTLL
1350 IFO<65 OR O>90 THEN PRINT#-
2,CHR$(128);CHR$(128);CHR$(30);C
HR$(O);CHR$(18);CHR$(128);CHR$(1
28);:HH=HH+1:IFLL>=L THEN 1410EL
SENEXTLL
1360 FORY=1TO9
1370 PRINT#-2,CHR$(C(A,Y));
1380 NEXTY
1400 NEXTLL
1410 PRINT#-2
1420 PRINT#-2
1430 GOSUB1450
1440 GOTO1280
1450 '
1460 CLS:PRINT"BOLTYPE 1.0":PRIN
T"COPYRIGHT (C) 1983 BY M. FAHY"
:PRINT
1470 PRINT:PRINT"          A. OLD
ENGLISH":PRINT:PRINT"        B.
ITALICS":PRINT:PRINT"        C.
FUTURISTIC":PRINT:PRINT
1480 LINEINPUT"        SELECT MO
DE :";CV$
1490 IF CV$="A"THEN1530
1500 IF CV$="B"THEN1280
1510 IF CV$="C"THEN1680
1520 GOTO1450
1530 '  OLDE ENGLISH
1540 PRINT#-2,CHR$(18);
1550 CLS0:PRINT@490,"old"+CHR$(1
28)+"english";:PRINT@0,"";
1560 LINEINPUT"message";A$
1570 FORFI=1TO2
1580 FORSL=1TOLEN(A$)
1590 PS=ASC(MID$(A$,SL,1))
1600 IFPS<45 OR PS>90THENPRINT#-
2,STRING$(7,128);:GOTO1650
1610 FORTL=1TO LEN(OE$(PS-64,FI)
)
1620 PRINT#-2,CHR$(ASC(MID$(OE$(
PS-64,FI),TL,1)));
1630 NEXTTL
1640 PRINT#-2,CHR$(128);CHR$(128
);
1650 NEXTSL
1660 PRINT#-2:NEXTFI
1670 GOTO1450
1680 '  FUTURISTIC
1690 PRINT#-2,CHR$(18);
1700 CLS0:PRINT@490,"futuristic"
;:PRINT@0,"";:LINEINPUT"message"
;A$
1710 L=LEN(A$)
1720 FORLL=1TOL
1740 M$=MID$(A$,LL,1)
1750 O=ASC(M$):A=O-64
1760 IF O>96 AND O<123 THENPRINT
#-2,CHR$(30);CHR$(O-32);CHR$(18)
;:HH=HH+1:IFLL>=L THEN1840 ELSE
NEXTLL
1770 IF O<65 OR O>90 THEN PRINT#
-2,CHR$(30);CHR$(O);CHR$(18);CHR
$(128);CHR$(128);:HH=HH+1:IFLL>=
L THEN1840ELSENEXTLL
1780 IF A=9THENQ=4ELSEQ=9
1790 FORY=1TOQ
1800 PRINT#-2,CHR$(F(A,Y));
1810 NEXTY
1830 NEXTLL
1840 PRINT#-2:PRINT#-2:GOTO1450
```

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# The Mail

*(Charles Thonen is a chief warrant officer in the United States Army presently assigned to Fort Greely, Alaska.)*

32K
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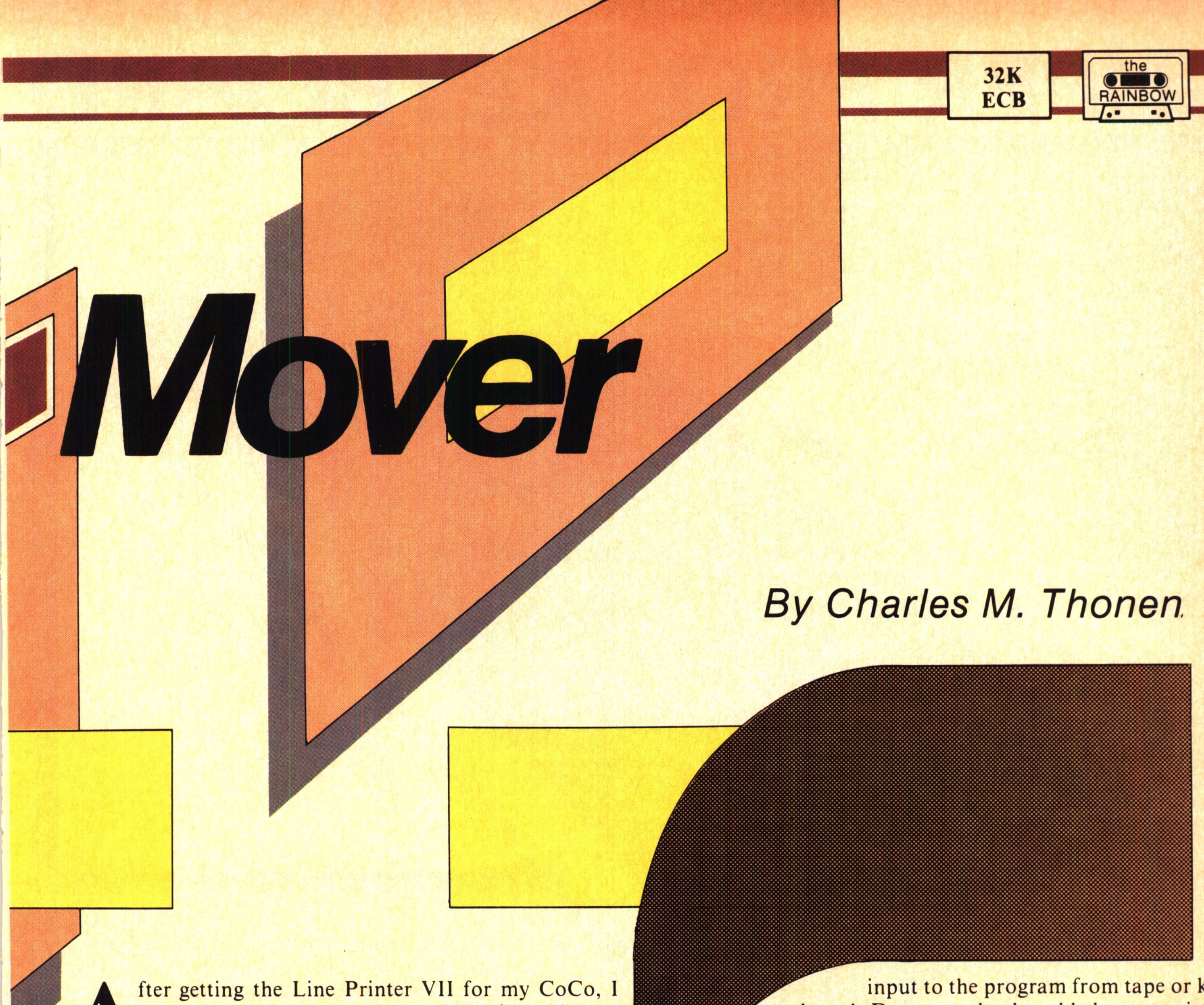

# Mover

### By Charles M. Thonen

After getting the Line Printer VII for my CoCo, I wanted a label program that would print addresses on the two-up dry gum labels that this printer uses. All of the programs in the magazines took the easy way out and just printed the same address on the second label. If only one label is needed, it is a waste of good labels. I wanted a program that didn't duplicate labels and had a good looking screen format. *Mailabel* does both of these and also has the usual edit, add, delete, search, and functions.

The program is written for a 32K machine and is for a tape-based system. A *PCLEAR 1* has to be entered due to the size of the *CLEAR* and *DIM* statements in line 120. The program can easily be changed to disk by the following line changes.

Change the word TAPE to DISK in line 5020
Delete lines 5020 through 5120
Delete the negative sign in lines 5140 and 5180
Change the *PRINT#-1* to *WRITE #1* in line 5160
Change the word TAPE to DISK in line 6020
Delete lines 6040 through 6120
Delete the negative signs in lines 6160, 6170 and 6200

*Mailabel* is written with subroutines to help follow the program logic. The sort routine is a fast machine language sort from Radio Shack's *Microcomputer News* (Vol. 4, Issue 6).

*Mailabel* comes up with the main menu page on the screen. There are nine options to choose from. Data can be input to the program from tape or keyboard. Data can also be added to an existing file. Records can be edited or deleted. Provisions are made to save a file to tape. Records can be printed to the screen and/or printer. This is an unformatted dump to the printer. Labels, either one-up or two-up, can be printed. There is also a search and sort feature.

Both Input Record and Add To List will bring up the Input Record Screen. If a file has already been loaded, the Input Record Option will not operate. This will stop you from wiping out the file already in memory. After entering either a 1 or 3, the Input Record Screen will be up showing the number of the record to be entered. Press [ENTER] after inputting the lines information and the cursor will jump to the next line. If a particular item is not known just press [ENTER]. After inputting the last line, hit [ENTER] and a fresh screen will come up for the next record. Now you can enter another record, or by pressing the down arrow return to the menu.

The Edit option will ask for the record number to edit. If no record number is entered, you will return to the menu by hitting [ENTER]. After entering a record number, that record will be displayed and an orange cursor will come up just to the left of the last name in the record. To go to the next line just press [ENTER]. The cursor will move down to the next line. By pressing [ENTER] when the cursor is on the bottom line the program will recycle to a new Edit screen. Here you can either edit another record or return to the

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menu. If you want to change any line, just position the orange cursor on that line and press the down arrow. That line will be removed and a flashing cursor will appear waiting for new input. Hit [ENTER] when the new information is on the line and the orange cursor will reappear on the top line. After all corrections are made to the record, you can bring up a new Edit screen by continuously hitting [ENTER] until the new Edit screen comes up.

The Delete option will delete any record from the file. If no record number is entered, you will return to the menu. Enter a record number and the record will appear on the screen. If you then decide not to delete the record just press [ENTER] and the program will recycle to a new Delete screen. If you want to delete the record, hit the up arrow. At this time you will be given one last chance to change your mind by answering a sure (Y/N) prompt. By answering N you will be returned to the menu. A Y answer will cause the record to be deleted from the file and the file updated. The program at this point jumps to the ML Sort, line 13000. This sort will place null strings at the end of the array. It then goes to the Y pointer reset at line 13050 and resets the next record available to the first null string that it finds. Option 5 allows you to print all records to the screen and/or the printer. This is an unformatted output to the printer, showing all information in each string to include the delimiters required for program operation. The down arrow will return you to the menu. Options 6 and 7 save and load the file to and from tape. Needed prompts are displayed to allow for proper positioning of the tape. These two subroutines can easily be changed to tape by making the changes detailed earlier.

Option 7 is the main purpose of *Mailabel*. It allows printing of either one-up or two-up labels. The first record and last record prompt have default values built in to someone just pressing [ENTER]. It will then ask if you have one-up or two-up labels. The subroutine at 7000 formats the records correctly. After the records are printed the program will return to the menu.

Option 9 brings up a Sort and Search menu. The sort by last name is the fastest. It goes directly to the ML sort routine. The other three sorts take longer because they have to reconfigure the strings before and after the ML sort. The Search will search the file for any combination of letters and numbers. If you answer the search prompt with nothing the program will start at record 1 and progress through the records.

This program has accomplished everything that I set out to do. At the same time it taught me a lot about string handling and the use of subroutines.

One last thing, if you can afford a disk, by all means get one. Being released from the tape system is like moving from a bicycle to a motorcycle.

| | | | |
|---|---|---|---|
| 260 | 202 | 7340 | 11 |
| 1185 | 151 | 8130 | 164 |
| 2190 | 110 | 8540 | 112 |
| 3110 | 128 | 8900 | 138 |
| 4200 | 152 | 10040 | 128 |
| 6030 | 42 | 11080 | 191 |
| 7060 | 239 | END | 34 |

**The listing:**

```
10 ' *** MAILING   LABELS    ***
20 ' ****************************
30 ' *** CHARLES M. THONEN   ***
40 ' *** PO BOX 666          ***
50 ' *** FT. GREELY AK 98733 ***
60 ' ****************************
120 CLS:CLEAR 13000,&H7E6F:DIMS$
(500):GOSUB12000
130 LL=0:ST$=STRING$(32,"*"):S$(
0)="0"
140 CLS
150 PRINTST$;
160 PRINTTAB(9)"MAILING LABELS"
170 PRINTST$;
180 'PRINTTAB(1)"MEM LEFT="MEM
190 PRINT
200 PRINTTAB(5)"(1)   INPUT RECOR
D"
210 PRINTTAB(5)"(2)   EDIT RECORD
"
220 PRINTTAB(5)"(3)   ADD TO LIST
"
230 PRINTTAB(5)"(4)   DELETE RECO
RD"
240 PRINTTAB(5)"(5)   PRINT ALL R
ECORDS"
250 PRINTTAB(5)"(6)   SAVE FILE"
260 PRINTTAB(5)"(7)   LOAD FILE"
270 PRINTTAB(5)"(8)   ADDRESS LAB
ELS"
280 PRINTTAB(5)"(9)   SEARCH & SO
RT"
290 PRINT
300 INPUT"ENTER CHOICE (1-9) ";M
310 IF M<0ORM>9THEN130
320 ON M GOSUB 1000,2000,1030,30
00,4000,5000,6000,7000,8000
330 POKE65494,0 'LOWSPEED
340 GOTO140
1000 '******** INPUT/ADD********
1010 IF Y>1 THEN RETURN
1020 Y=1
1030 B=1:C=0:GOSUB11000
1040 PRINT@5,"**** INPUT RECORD
 ****"
1050 PRINT@70,"INPUT RECORD # "Y
1060 C=0:P=173
1070 S$(Y)=""
1080 A$=INKEY$:IF A$=""THEN 1080
1090 IF A$=CHR$(13) THEN A$=",":
 C=C+1:B=L+2:IF C<7 THENPRINT@P+
32,CHR$(62);
1100 IF C=1THEN P=205
1110 IF C=2 THEN P=237
1120 IF C=3 THEN P=269
1130 IF C=4 THEN P=301
1140 IF C=5 THEN A$="*":P=333:C=
6
```

```
1150 IF C=7 THEN 1270
1160 IF PEEK(343)<>247 THEN 1200
1170 L=L-1:IF L<0 THEN 1030
1180 S$(Y)=LEFT$(S$(Y),L)
1185 PRINT@P+POS(0)-14,".";
1190 GOTO1220
1200 IF A$=CHR$(10) THEN 1260
1210 S$(Y)=S$(Y)+A$
1220 L=LEN(S$(Y))
1230 PRINT@P,MID$(S$(Y),B,L);
1240 IF L=0 THEN 1030
1250 GOTO1080
1260 IF S$(Y)=""THEN RETURN
1270 Y=Y+1
1280 LL=LL+L:GOTO1030
2000 '********** REPLACE *******
2010 N=0:L=0
2020 CLS:GOSUB11020
2030 PRINT@173,CHR$(46);
2040 PRINT@7,"***** EDIT *****"
2050 PRINT@405,"TO CHANGE"
2060 PRINT@68,"INPUT RECORD # TO
 EDIT";
2070 PRINT@92,"";:LINEINPUTN$:N=
VAL(N$)
2080 PRINT@64," >>>>OLD RECORD T
O REPLACE<<<<"
2090 IF N=0 THEN RETURN
2100 GOSUB10000
2110 ' ***** CHANGE *****
2120 C=1:P=172
2130 PRINT@P,CHR$(255);
2140 A$=INKEY$:IF A$=""THEN 2140
 ELSE IF A$=CHR$(10)THEN 2150ELS
E 2240
2150 PRINT@P,STRING$(19," ");
2160 PRINT@P+1,"";:LINEINPUTN$
2170 Z=L(C-1)
2180 L$=LEFT$(S$(N),Z)
2190 R$=RIGHT$(S$(N),LEN(S$(N))-
L(C)+1)
2200 IF C=1 THEN S$(N)=N$+R$:GOT
O 2230
2210 IF C=6 THEN S$(N)=L$+N$:GOT
O2230
```

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```
2220 S$(N)=L$+N$+R$
2230 IF C<6 THEN 2100
2240 PRINT@P," ";:C=C+1:P=P+32
2250 IF C>6 THEN 2010
2260 GOTO2130
3000 '******* DELETE RECORD ****
*
3010 CLS:GOSUB 11030
3020 PRINT@393," UP  ARROW] TO D
ELETE"
3030 PRINT@3,"***** DELETE RECOR
D *****"
3040 PRINT@67,"ENTER RECORD # TO
 DELETE ";:LINEINPUTD$
3050 N=VAL(D$):IF N=0 THEN RETUR
N
3060 GOSUB10000
3070 A$=INKEY$:IF A$=""THEN 3070
 ELSE IF A$="^" THEN 3085
3080 GOTO3000
3085 PRINT@427,"";:LINEINPUT"SUR
E (Y/N) ";CK$
3090 IF CK$="Y" THEN S$(N)=""ELS
E 3150
3100 FOR Z=173 TO 333 STEP 32
3110 PRINT@Z,STRING$(14,"*")
3120 NEXTZ
3130 FORDL=1TO700:NEXT
3140 GOSUB 13010
3150 RETURN
4000 '**** PRINT ALL RECORDS ***
4010 CLS
4020 PRINTST$;
4030 PRINTTAB(12)"PRINT"
4040 PRINTST$;
4050 PRINT@166,"(1) SCREEN ONLY"
4060 PRINT@198,"(2) PRINTER & SC
REEN"
4070 PRINT@290,"";
4080 LINEINPUT"ENTER CHOICE (1-2
) ";M$:M=VAL(M$)
4090 IF M=0 THEN RETURN
4100 IF M <1 OR M >2 THEN RETURN
4110 CLS:GOSUB 11030
4120 FOR N=1 TO Y-1
4130 GOSUB11030
4140 PRINT@6,"**** PRINT OUT ***
*"
4150 IF Y=0 THEN PRINT@70,"NO RE
CORDS IN FILE":GOTO4190
4160 PRINT@70,"RECORD NUMBER "N
4170 GOSUB 10000
4180 IF M<>1 THEN 4200
4190 A$=INKEY$:IF A$=CHR$(10)THE
N 4220 ELSE IF A$=""THEN 4190
4200 IF M=2 THEN GOSUB 4230
4210 NEXTN
4220 RETURN
4230 IF S$(N)<>""THEN PRINT#-2,N
;S$(N)
```

```
4240 RETURN
5000 '**** SAVE TO TAPE ****
5010 CLS:PRINTST$;
5020 PRINTTAB(7)"SAVE FILE ON TA
PE"
5030 PRINTST$
5040 AUDIOON:MOTORON
5050 PRINTTAB(9)"POSITION TAPE."
5060 PRINTTAB(3)"";:LINEINPUT"PR
ESS [ENTER] WHEN DONE.";R$
5070 MOTOROFF
5080 PRINT:PRINT
5090 PRINTTAB(5)"PRESS PLAY AND
RECORD."
5100 PRINTTAB(3)"PRESS [ENTER] W
HEN READY.";
5110 LINEINPUTR$
5120 PRINT
5130 PRINTTAB(3)"";:LINEINPUT"IN
PUT FILE NAME...  ";FF$
5140 OPEN "O",#-1,FF$
5150 FORX=1TO Y-1
5160 PRINT#-1,S$(X)
5170 NEXTX
5180 CLOSE#-1
5190 FOR DL=1 TO 50:PRINTTAB(8)"
FILE SAVED":NEXT
5200 RETURN
6000 '****** LOAD FROM TAPE ****
6010 CLS:PRINTST$;
6020 PRINTTAB(6)"LOAD FILE FROM
TAPE"
6030 PRINTST$
6040 MOTORON:AUDIOON
6050 PRINTTAB(9)"POSITION TAPE."
6060 PRINTTAB(3)"";:LINEINPUT"PR
ESS [ENTER] WHEN DONE.";R$
6070 MOTOROFF
6080 PRINT:PRINT
6090 PRINTTAB(10)"PRESS PLAY."
6100 PRINTTAB(3)"PRESS [ENTER] W
HEN READY.";
6110 LINEINPUT R$
6120 PRINT
6130 PRINTTAB(3)"";:LINEINPUT"IN
PUT FILE NAME...  ";FF$
6140 OPEN"I",#-1,FF$
6150 Y=1
6160 IF EOF(-1) THEN 6200
6170 INPUT#-1,S$(Y)
6180 Y=Y+1
6190 GOTO 6160
6200 CLOSE #-1
6210 FOR DL=1TO50:PRINTTAB(8)"FI
LE LOADED":NEXT
6220 RETURN
7000 '******* LABEL PRINT *****
7010 CLS:PRINTST$;
7020 PRINTTAB(10) "LABEL MAKER"
7030 PRINTST$
7040 U=2:Z=1'** U SETS DEVICE TO
                 ** PRINT TO
7050 INPUT"    FIRST RECORD TO P
RINT  ";I1:IFI1=0 THEN I1=1:PRIN
T@156,I1
7060 PRINT@160,"";:INPUT"    LAS
T RECORD TO PRINT   ";I2:IF I2=0
 THEN I2=105 :PRINT@188,I2
7070 PRINT@230,"INSERT LABEL PAP
ER"
7080 PRINT@263,"";:INPUT" 1 OR 2
 UP ";CC
7090 IF CC<1 OR CC>2 THEN 7080
7100 '****** END OF HEADER ****
7110 FOR N=I1 TO I2
7120 IF S$(N)=""THEN RETURN
7130 CLS0:GOSUB10020
7140 IF CC=1 THEN GOSUB 7190
7150 IF CC=2 THEN GOSUB 7280
7160 NEXTN
7170 A$=INKEY$:IF A$=""THEN 7170
7180 RETURN
7190 '**** 1 UP PRINT ****
7200 PRINT#-U,""
7210 PRINT#-U,TAB(1)SS$(2)+" ";
7220 PRINT#-U,TAB(1)SS$(1)
7230 PRINT#-U,TAB(1)SS$(3)
7240 PRINT#-U,TAB(1)SS$(4)+" ";
7250 PRINT#-U,TAB(1)SS$(5)
```

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```
7260 PRINT#-U,"":PRINT#-U,""
7270 RETURN
7280 '**** 2 UP PRINT ****
7290 IF Z=2 GOTO7340
7300 LS$(1)=SS$(2)+" "+SS$(1)
7310 LS$(2)=SS$(3)
7320 LS$(3)=SS$(4)+" "+SS$(5)
7330 Z=2:RETURN
7340 RS$(1)=SS$(2)+" "+SS$(1)
7350 RS$(2)=SS$(3)
7360 RS$(3)=SS$(4)+" "+SS$(5)
7370 PRINT#-U,""
7380 PRINT#-U,TAB(1)LS$(1);TAB(4
1)RS$(1)
7390 PRINT#-U,TAB(1)LS$(2);TAB(4
1)RS$(2)
7400 PRINT#-U,TAB(1)LS$(3);TAB(4
1)RS$(3)
7410 PRINT#-U,"":PRINT#-U,""
7420 Z=0:RETURN
8000 '***** SORT & SEARCH ****
8010 '***** MAIN MENU      ****
8020 POKE65495,1 ' HI SPEED
8030 CLS:PRINTST$;
8040 PRINTTAB(09) "SORT & SEARCH
"
8050 PRINTST$
8060 PRINTTAB(5)"(1)   SORT BY LA
ST NAME"
8070 PRINTTAB(5)"(2)   SORT BY ST
ATE"
8080 PRINTTAB(5)"(3)   SORT BY ZI
P CODE"
8090 PRINTTAB(5)"(4)   SORT BY AR
EA CODE"
8100 PRINTTAB(5)"(5)   SEARCH"
8110 PRINT:PRINT:PRINT"  PRESS [
ENTER] FOR MAIN MENU"
8120 INPUT"      ENTER CHOISE (1
-5) ";MM
8130 ON MM GOSUB 8200,8300,8500,
8700,8900
8140 IF MM<1ORMM>5THENRETURN
8150 GOTO 8030
8200 '***** SORT BY NAME  *****
8210 CLS:IF S$(1)=""THEN PRINT@2
01,"FILE IS EMPTY":FOR DL=1TO500
:NEXTDL:RETURN
8220 CLS:PRINT@204,"SORTING"
8230 GOSUB 13010
8240 PRINT@201,"SORT COMPLETE"
8250 FOR DL=1TO500:NEXTDL
8260 RETURN
8300 '***** SORT BY STATE *****
8310 CC=3:CLS:PRINT@205,"SORTING
"
8320 FOR N=1TOY-1
8330 GOSUB 10020
8335 IF LEN(SS$(5))<2 THEN SS$(5
)="ZZ"
8340 S$(N)=LEFT$(SS$(5),2)+S$(N)
8350 NEXTN
8360 GOSUB 13010
8370 FORN=1TOY-1
8380 S$(N)=RIGHT$(S$(N),LEN(S$(N
))-2)
8390 NEXTN
8400 GOTO 8620
8410 RETURN
8500 '***** SORT BY ZIP   *****
8510 CC=3:CLS:PRINT@205,"SORTING
"
8520 GOSUB 13010
8530 FORN=1TOY-1
8540 GOSUB 10020
8545 IF LEN(SS$(5))<5 THEN SS$(5
)=SS$(5)+"99999"
8550 S$(N)=RIGHT$(SS$(5),5)+S$(N
)
8560 NEXTN
8570 GOSUB 13010
8580 FORN=1TOY-1
8590 IF LEN(S$(N))<5 THEN 8610
8600 S$(N)=RIGHT$(S$(N),LEN(S$(N
))-5)
8610 NEXT N
8620 PRINT@200,"SORT COMPLETE":F
ORDL=1TO400:NEXTDL
8630 RETURN
8700 '***** SORT BY A/C   *****
8710 CC=3:CLS:PRINT@205,"SORTING
"
8720 GOSUB 13010
8730 FOR N=1TOY-1
8740 GOSUB 10020
8745 IF LEN(SS$(6))<3 THEN SS$(6
)="999"
8750 S$(N)=LEFT$(SS$(6),3)+S$(N)
8760 NEXTN
8770 GOSUB 13010
8780 FORN=1TOY-1
8790 S$(N)=RIGHT$(S$(N),LEN(S$(N
))-3)
8800 NEXT N
8810 GOTO 8620
8820 RETURN
8900 '***** SEARCH *****
8910 CLS:PRINTST$;
8920 PRINTTAB(12)"SEARCH"
8930 PRINTST$
8940 IF Y<1 THEN PRINT@260,">>>N
O RECORDS IN FILE<<<":FOR DL=1TO
500:NEXTDL:RETURN
8950 INPUT"INPUT SEARCH WORD";SW
$
8960 FOR N=1TO Y-1
8970 IF S$(N)=""THEN 9090
8980 TG=INSTR(1,S$(N),SW$)
8990 IF TG>0 THEN 9020
9000 NEXTN
```

```
9010 GOTO9090
9020 CLS:GOSUB 11030
9030 PRINT@7,"**** SEARCH ****"
9040 PRINT@69,"THIS IS RECORD #
";N
9050 PRINT@419,"PRESS [ENTER] TO
 CONTINUE."
9060 GOSUB 10000
9070 A$=INKEY$:IF A$=CHR$(10) TH
EN RETURN ELSE IF A$=""THEN 9070
9080 NEXTN
9090 CLS:PRINT@201,"END OF FILE"
9100 FOR DL=1TO500:NEXTDL:GOTO89
00
10000 '*** PRINTS STRING TO ***
       *** FORMATED SCREEN   ***
10010 CC=0
10020 C=1:O=1:P=173:L=0:LN=0:L1=
0:L(0)=1
10030 L=INSTR(O,S$(N),","):L(C)=
L:IF L=0 THEN RETURN
10040 SS$(C)= MID$(S$(N),O,L-LN-
1):IF CC THEN 10060
10050 PRINT@P,SS$(C)
10060 C=C+1:O=L+1:P=P+32:LN=L
10070 IF C=5 THEN 10090
10080 GOTO10030
10090 L1=INSTR(L,S$(N),"*"):L(C)
=L1
10100 SS$(C)=MID$(S$(N),O,L1-L-1
):IF CC THEN 10120
10110 PRINT@P,SS$(C)
10120 SS$(C+1)=RIGHT$(S$(N),LEN(
S$(N))-L1)
10130 IF CC THEN 10150
10140 PRINT@P+32,SS$(C+1)
10150 RETURN
11000 '***** SCREEN FROMAT *****
11010 L=0
11020 CLS:PRINT@34,"HIT [ENTER]
AFTER EACH ITEM ";
11030 PRINT@(96),ST$
11040 PRINT@160,"LAST NAME  : ";
:PRINTCHR$(62);:PRINTSTRING$(13,
".")
11050 PRINT@192,"FIRST NAME : ";
:PRINTSTRING$(14,".")
11060 PRINT@224,"STREET     : ";
:PRINTSTRING$(14,".")
11070 PRINT@256,"CITY       : ";
:PRINTSTRING$(14,".")
11080 PRINT@288,"STATE ZIP  : ";
:PRINTSTRING$(14,".")
11090 PRINT@320,"AC/PHONE   : ";
:PRINTSTRING$(14,".")
11100 PRINT:PRINTTAB(2)"PRESS [D
OWN ARROW] WHEN DONE"
11110 RETURN
12000 '**** ML SORT DATA *****
12010 DATA 190,127,011,52,16,238
,228,174,94,48,31,79,52,18,166,1
96,39,42,166,196,230,69,160,69,3
6,2,230,196,52,1,174,66,16,174,7
1
12020 DATA 109,69,38,4,50,97,32,
41,166,128,160,160,39,4,50,97,32
,5,90,38,243,53,1,35,24,174,66,1
6,174,71,175,71,16,175,66,166
12030 DATA 196,230,69,231,196,16
7,69,234,69,234,228,231,228,51,6
9,174,97,48,31,175,97,38,176,166
,228,50,99,38,161,50,98,57
12040 FOR I=&H7E70 TO &H7ED6
12050 READ A:POKE I,A
12060 NEXTI
12070 DEFUSR0=&H7E70
12080 RETURN
13000 '**** SORT ROUTINE *****
13010 NO=VARPTR(S$(0))
13020 POKE &H7F0B,INT(NO/256)
13030 POKE &H7F0C,NO-INT(NO/256)
*256
13040 A=USR0(0)
13050 '*** Y POINTER RESET ***
13060 FORN=Y TO 1STEP-1
13070 IF S$(N)<>""THEN13090
13080 NEXT N
13090 Y=N+1
13100 RETURN
```

---

*Hint . . .*

## Data Finder

Have you ever gone through your tapes or disks and found a data file that you couldn't identify? Well, I have, and it's a pain when you can't load it without the program and you can't find out what program it came from. Here is a program to solve your problems. Simply type in and run the program, and when it finds the file it will put it on the screen or on paper if you have a printer.

```
20 CLS:INPUT“WHAT IS THE NAME OF THE DATA FILE”;DF$
30 OPEN “I”,#1,DF$
40 INPUT#1,D$
50 PRINT D$
60 IF D$=“EOF” OR D$=“” THEN 80
70 GOTO 40
80 CLOSE #1
```

If you want to load a data file from tape, change *#1* to *#-1* in lines 30, 40 and 80. If you want to print our the data, change line 50 to *PRINT#-2, D$*.

**Chris Stevenson**
**Crocker, Mo.**

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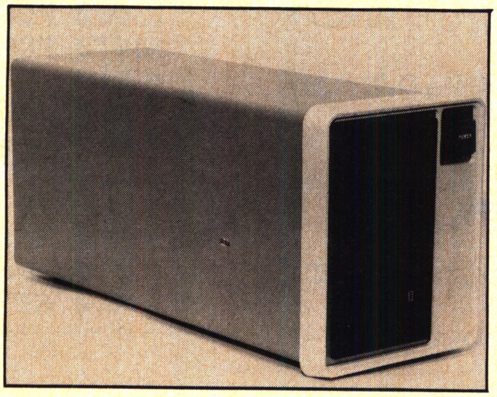

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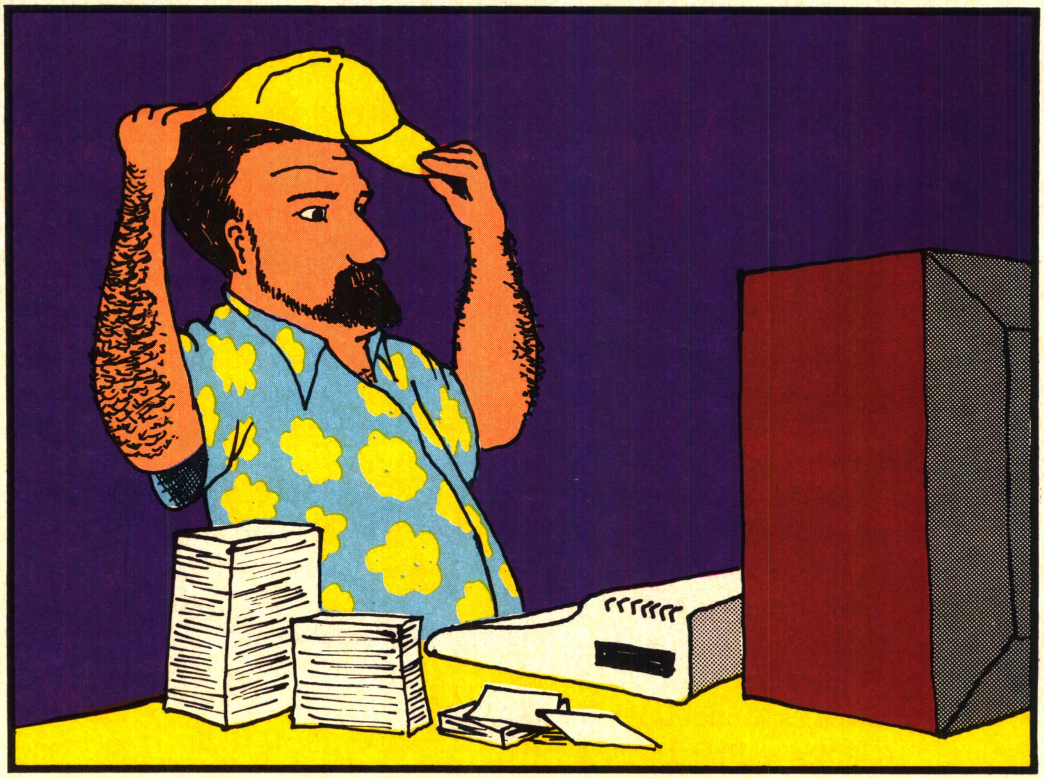
*When we last saw Fred, he had just finished a face-saving program for addressing his wife's envelopes. this month he's at it again . . .*

# Fred's Postcard Whacker

### By Don Hughes and Jessie James



Fred slipped past the screen door and waltzed into the kitchen, where his wife was giving the poodle a permanent.

"It's late," she said. "Why have you been out so late?"

*(Don Hughes, a writer and consultant, holds two master's degrees, one in education and the other in counseling. Jessie James has been engaged for the past 10 years in the electronic repair field. He is a bio-medical equipment technician at Kaiser Foundation Hospital in Fortana, Calif.)*

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"The most fantastic thing happened to me," said Fred as he danced around the room.

His wife looked at him with a jaundiced eye. "What have you been up to Fred?" she demanded.

"I was just elected corresponding secretary of the Inland Empire Color Computer Club."

"Have you got into something that's going to make extra work for me?" she asked warily.

"No. Absolutely not! I have to write an occasional letter, but my main job is to send postcards to the members every month to remind them of the meetings."

"Then you expect me to write dozens of cards out in longhand every month?" Fred's wife cackled.

Fred scratched his beard. "I figured you could do my postcards along with the ones you send out to your bridge club."

Fred's wife reached for the curling iron, still hot from the dog's permanent. She waved it under his nose. "You and that fancy computer. You keep telling me it saves work, but as far as I can tell, it only makes work for me."

Fred retreated to his computer haven. As he sat down in front of the keyboard, his mind drifted to possible solutions to his dilemma. He loved his wife in spite of the poodle and everything, and he really did want to put his CoCo to work in useful ways.

Absentmindedly, Fred spun his chair around and began flipping through his back issues of *the Rainbow*. As he leafed through the well-worn pages, he could not remember seeing an article or ad which offered a program that addressed postcards, but . . . maybe he had overlooked something.

When the clock struck midnight, Fred was suddenly awakened from the hypnotic concentration that had engulfed him. Knowing of no other avenue, he got up to make sure the door to his study was locked, pulled down the blinds, then removed his thinking cap from the special hiding place. He put it upon his head and suddenly the room was ablaze with creativity. In an instant he had the answer! He would write a program which would meet the need!

The program Fred created that night is listed below. It allows you to input a salutation and a closing line (40 characters each). At that point, a blue field appears on the screen. Both Fred and his wife, and you as well, can type your message within the confines of the field. There's no need to worry about formatting on the screen because the program takes care of this while the "One Moment Please . . ." prompt appears on the screen.

Once you answer the "print" prompt that appears on the screen, the program automatically prints your message, properly formatted, on a standard USPS postcard.

Need to print the same message to everyone in your group like Fred? Simply answer the prompt in a positive way, and the same message can be printed over and over.

This program is for a 16K Extended CoCo as listed. If you don't have an extended machine, just change the "Line Inputs" in lines 74 and 76 to "Inputs." A friction feed printer is recommended.

After Fred showed this program to his wife, she gave him a big hug. "You're my hero," she said.

| | |
|---|---|
| 28 | 12 |
| 55 | 162 |
| 84 | 62 |
| 115 | 170 |
| END | 145 |

**The listing:**

```
1 '"POSTCARD WHACKER"
2 ' BY JESSIE JAMES AND
3 ' DON HUGHES
4 ' P.O. BOX 6363
5 ' SAN BERNARDINO, CA. 92412
6 ' COPYRIGHT 1983, JESSIE
7 ' JAMES AND DON HUGHES
8 CLEAR5000
9 CLS
10 GOSUB 72
12 A=0
13 A$=INKEY$
14 IF PEEK(341)=247 THEN A=4
15 IF PEEK(342)=247 THEN A=3
16 IF PEEK(343)=247 THEN A=2
17 IF PEEK(344)=247 THEN A=1
18 ON A GOTO 52,43,35,27
19 IF A$=CHR$(12) THEN 84
20 IF A$="" THEN 24 ELSE A=ASC(A
$):IF A=8 OR A=9 OR A=10 OR A=94
 THEN 12
21 PRINT A$;
22 GOSUB 67
23 IF B>1503 THEN POKE 137,PEEK(
137)-1
24 GOSUB 60
25 GOTO 12
27 GOSUB 67
28 IF PEEK(B-32)=207 THEN 12
29 D=PEEK(137): IF D<32 THEN POK
E 136,PEEK(136)-1:POKE 137,(D-32
)+256 ELSE POKE 137,PEEK(137)-32
30 GOSUB 67
31 IF B<1024 THEN POKE 136,5
32 GOSUB 60
33 GOTO 12
35 GOSUB 67
36 IF PEEK(B+32)=207 THEN 12
37 D=PEEK(137):IF D>223 THEN POK
E 136,PEEK(136)+1:POKE 137,(D+32
)-256 ELSE POKE 137,PEEK(137)+32
38 GOSUB 67
39 IF B>1535 THEN POKE 136,4
40 GOSUB 60
41 GOTO 12
43 GOSUB 67
44 IF PEEK(B-1)=207 THEN 12
45 IF PEEK(137)=0 THEN POKE 137,
255:POKE 136,PEEK(136)-1 ELSE PO
KE 137,PEEK(137)-1
46 GOSUB 67
47 IF PEEK(B-1)=207 THEN 12
48 IF B<1024 THEN POKE 136,5:POK
E 137,255
49 GOSUB 60
50 GOTO 12
```

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```
52 GOSUB 67
53 IF PEEK(B+1)=207 THEN 12
54 IF PEEK(137)=255 THEN POKE 13
7,0:POKE 136,PEEK(136)+1 ELSE PO
KE 137,PEEK(137)+1
55 GOSUB 67
56 IF B>1535 THEN POKE 136,4:POK
E 137,0
57 GOSUB 60
58 GOTO 12
60 GOSUB 67
61 T=PEEK(B)
62 POKE B,159
63 FOR Y=1 TO 5:NEXT Y
64 POKE B,T
65 RETURN
67 B=PEEK(136):C=PEEK(137)
68 POKE 136,B:POKE 137,C
69 B=B*256+C
70 RETURN
72 CLS
73 PRINT"PLEASE INPUT YOUR
         SALUTATION    ";
74 LINE INPUT S$
75 PRINT"PLEASE INPUT YOUR
         CLOSING    ";
76 LINE INPUT C$
77 CLS5
78 PRINT @ 0,"INPUT MESSAGE, HIT
 CLEAR TO END ";
79 PRINT @ 64,STRING$(255,175);
80 PRINT STRING$(161,175);
81 POKE 136,4:POKE 137,64
82 RETURN
84 SOUND 200,1:PRINT@0,"ONE MOME
NT PLEASE..."
85 FOR X=1088 TO 1300
86 A=PEEK(X)
87 GOSUB 97
88 A$(1)=A$(1)+CHR$(A)
89 NEXT X
90 FOR X= 1301 TO 1503
91 A=PEEK(X)
92 GOSUB 97
93 A$(2)=A$(2)+CHR$(A)
94 NEXT X
95 A$=A$(1):B$=A$(2)
96 GOTO 102
97 IF A>127 THEN A=32:RETURN
98 IF A<32 THEN A=A+96:RETURN
99 IF A>90 AND A<128 THEN A=A-64
100 IF A=18 OR A=30 OR A=31 THEN
 A=32
101 RETURN
102 CLS
103 INPUT"PREPARE PRINTER
          PRESS <ENTER> WHEN REA
DY";Q$
104 P=40:FLAG=0
105 PRINT#-2,S$:PRINT#-2
106 S=1:E=S+P
107 L=LEN(A$)
108 FOR X=E TO S STEP -1
109 IF MID$(A$,X-1,1)= CHR$(32)
THEN 111
110 NEXT X
111 PRINT #-2, MID$(A$,S,X-S)
112 S=X:E=S+P
113 IF E<L THEN 108
114 IF FLAG=1 THEN PRINT #-2, RI
GHT$(A$,L-S+1):GOTO 119
115 A$=RIGHT$(A$,L-S+1)+"  "+B$
116 FLAG=1:L=LEN(A$)
117 S=1:E=S+P
118 GOTO 108
119 PRINT#-2
120 L=LEN(C$)
121 PRINT#-2, TAB(40-L);C$
122 CLS
123 INPUT "DO YOU WISH TO PRINT
          THE SAME CARD AGAIN (
Y/N)";Q$
124 IF Q$="Y" THEN 95
125 PRINT:PRINT
126 INPUT "DO YOU WISH TO PRINT
          A DIFFERENT MESSAGE (
Y/N)";Q$
127 IF Q$="Y" THEN RUN ELSE END
```

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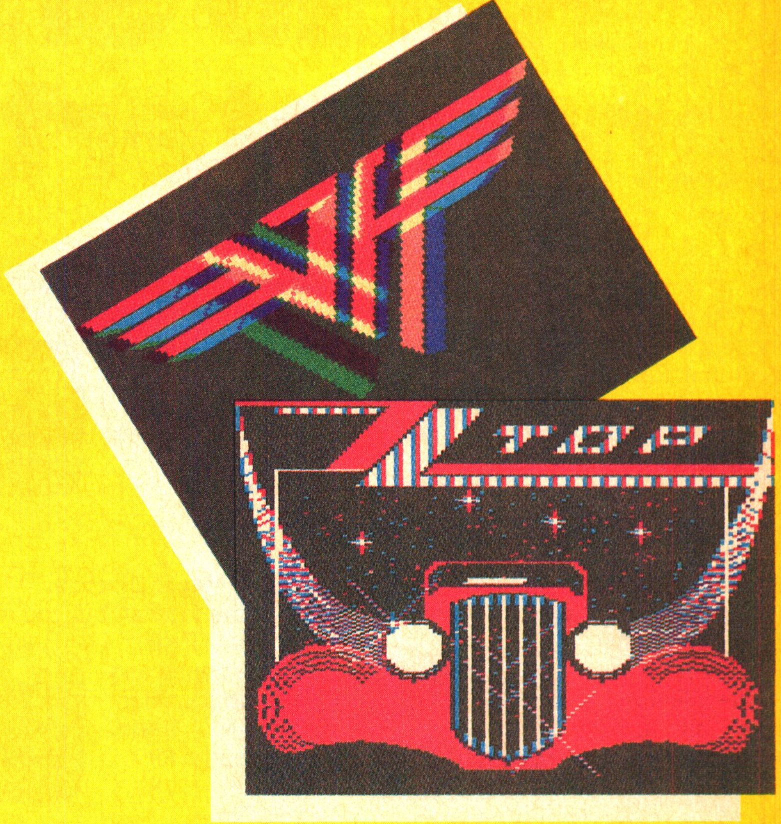
# The First CoCo Rockfest



By Fred B. Scerbo
*Rainbow* Contributing Editor

*Editor's Note: The "Rainbow Wishing Well" is a new regular feature of* the Rainbow *in which contributing editor Fred B. Scerbo will share with our readers various programs he has developed for the CoCo.*

*If you would like to submit a suggestion for a program you would like for your CoCo, submit it to Fred, c/o* the Rainbow. *We aren't promising any specific wish will be granted, but if the challenge looks good, Fred may list a program to accomplish your task. Please remember that any programs resulting from these suggestions become the property of the author.*

Here we are with our third installment of our "Rainbow Wishing Well" and already the wishes are starting to roll in. It will still take several months before some of these wishes are granted due to the delay time in publishing, so don't get discouraged. Keep your ideas coming, but please, keep your requests reasonable. (Remember, this is BASIC!) While I have received nothing but positive feedback so far, I have a feeling that this month's article and programs will generate more suggestions and requests from middle school and high school-aged programmers than any to date. Read ahead and you'll see why.

## The Initial Inspiration

By now, most of you are aware that I am a high school teacher of special needs students. While most of my day is spent with the handicapped, many times I will welcome students from the "mainstream" into my resource room to work with my students or to give them a chance to try our Color Computers. Even students who have not had much background in programming like to type in short programs which give instant results or feedback, and every day, I find that more and more of these students have CoCos at home.

One such visitor is a freshman named Aaron. Aaron has had his 64K CoCo for several months now and stops by my resouce room at least once each day to get new ideas or get some new insights into what his CoCo can do.

Unfortunately, Aaron still has a bit of an inferiority complex regarding his CoCo. If someone he knows with a Commodore 64 or an Apple computer shows him a "commercially available" program on his or her machine, he goes into a tailspin worrying about whether or not his CoCo can do the same. (Oh, ye of little faith!) Consequently, I often have to show him that many programs that can be written in our CoCo's Extended Color BASIC can sometimes match or even surpass what others have to *buy* for their computers.

One day recently, he came in upset over the fact that he saw a rival computer's program which would draw a piano and play "The Entertainer" while the player's hands danced around the screen. Could the Color Computer do the same was what he wanted to know.

My reaction, naturally, was, "Of course . . . but who cares! All the programs I've been writing and showing you have been practical. They do something!"

---

*(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)*

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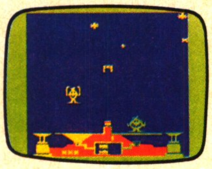

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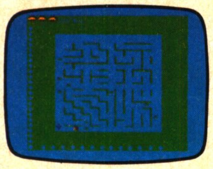

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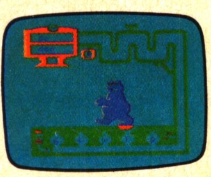

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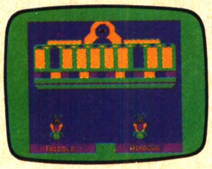

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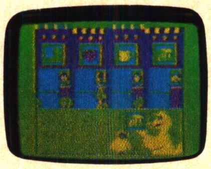

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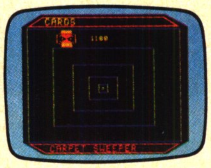

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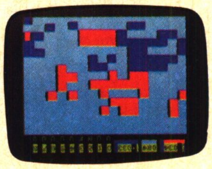

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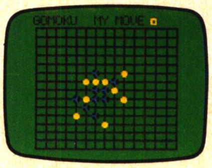

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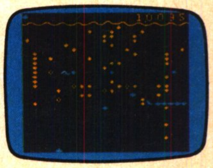

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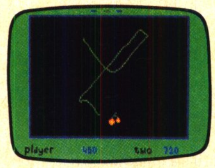

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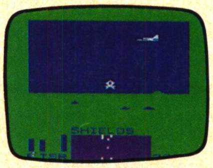

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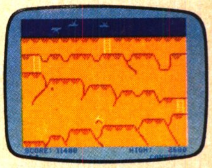

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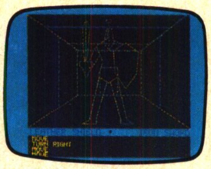

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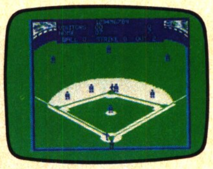

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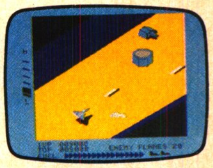

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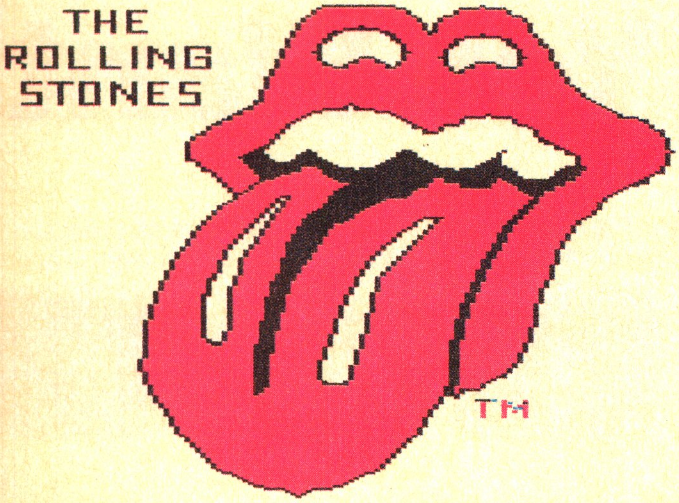
Still Aaron was not convinced about the superiority of his computer. It was time to pull another gem out of the wishing well. If he wanted "impressive" programming that did absolutely nothing productive, then that's what I would give him! (Do you see where the rock 'n 'roll fits in yet?)



### Inspiration Number Two

Aaron isn't the only one who comes knocking on my door asking for ideas or help. Quite often, students will come and ask me to help them sketch out the symbol for one of their favorite rock groups. (Usually the request is for AC-DC or Van Halen, while just a few short years ago, everyone wanted KISS.) These students will sometimes want these symbols to use in their graphic arts class where they can make note pads, letterheads or even silk screened T-shirts. After having been AC-DCed to death, I figured that there must be a way I could do this with my CoCo.

As I have mentioned, some of the students I have fall into the "mildly mentally handicapped" category. Believe it or not, they actually do enjoy coloring, much like one would in a coloring book, but they are too old for such things. Many times, I would help them draw rock posters which they would carefully decorate. Maybe this effort on the CoCo could also help me keep on top of this demand for coloring materials for some of my students.

### One Final Inspiration

Several weeks ago I had the chance to view a video broadcast of the US Festival, which was put together by Apple wizard Steve Wozniak. If the Apple computer could have a rock festival, why not have one for the Color Computer? Since we couldn't have a real one right away, I figured we could hold one inside the guts of the CoCo.

### The Wish

With all of this input, what kind of wish would I be granting? To put it simply, I would have to come up with the *first* real rock 'n' roll Color Computer program. The wish would be granted in two parts. The first would display some of the most colorful graphics I could generate on the CoCo which would be the logo or symbol for some of the most popular rock groups around today. This program could be used simply to impress your friends as to what your CoCo

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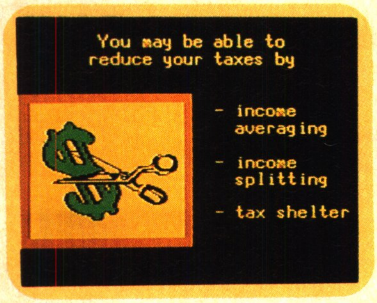
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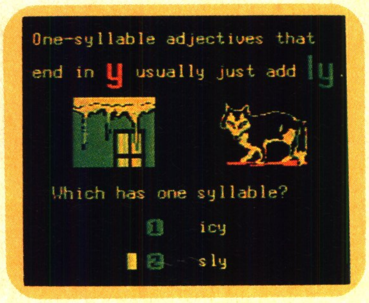
Which?
1 sister
2 smaller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end in y usually just add ly.
Which has one syllable?
1 icy
2 sly

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can do. (Okay, Aaron. Ask your friends if their computers can do that!) The program could also have a "party value" which we will discuss later.

The second part of the wish would be a program that would take these same graphics and generate a black and white graphic, which could be dumped to a line printer when used in conjunction with a graphic screen dump program (not included here). Thus, by using my Okidata 82A printer, I could generate the pages of a rock 'n' roll coloring book and have coloring sheets for my students at the flip of a switch.

So, here they are!

As I promised, the first program does nothing productive. It just draws some very impressive rock 'n' roll graphics and sits there. The second listing, *the Rockfest Coloring Book*, is slightly more productive, if you consider coloring productive.

If nothing else, the programs are *fun*!

## Inside The CoCo Rockfest

Imagine a rock festival with some the biggest names in the business. Who would you include? For the First CoCo Rockfest (you mean there will be others?) I selected eight rock acts with attractive symbols that would not drive me crazy as they were drawn out in BASIC. The groups suggested by the high school students I spoke with included the Rolling Stones, Asia, Quiet Riot, Z Z Top, Van Halen, Yes, 38 Special, and, of course, AC-DC. While Listing 1 is for 32K, fear not. I have designed this program so it can be broken into smaller programs for each group. Therefore, those of you with 16K Extended can go to the part of the listing and just type in the line for the group you wish to draw. The main program has a menu and a title card which actually lowers the curtain on our stage which is fun to watch in and of itself.

A WORD OF WARNING!

If you do try typing in just parts of the listing, be sure to include: *5 PCLEAR8* or the program may crash. Those of you who have typed in some of my other programs will be familiar with the fact that I like to *DRAW* on a graphic page out of view and then *PCOPY* the results to the screen you are viewing. *Rockfest* incorporates this technique although I have kept the screen turned on part of the time so you can see how the images are formed. Since *PCLEAR* reserves extra graphic pages, you can take advantage of this hidden drawing technique. If you were to leave out the *PCLEAR8*, normally, you would just get an ?FC Error. However, some parts of the program use *PCOPY* to pages not yet displayed, so if you were to leave out the *PCLEAR* statement by mistake, the *PCOPY* command would try to write the graphics *on top* of your BASIC program, causing it to crash in a non-retrievable way.

Therefore, if you are going to try to use parts of these graphics, be sure to include *5 PCLEAR8* as your first line. I have included it at the end of the listing accessed by a *GOTO* to keep you from running the program before it is all keyed in. (Now would be a good time for Rainbow On Tape!)

If you just use parts, you will also have to include: *6 R=3:R$="C3"*, so as to insure the use of red in *PMODE4*. You may have to press [RESET] to get the right color. (For example: On the Rolling Stones, who wants a blue tongue?) You could also change both threes to twos in this new line 6 to get the same result.

The completed program actually solves this problem for you by printing a row of A's and B's at the bottom of the screen. You may activate the program from the title card by pressing the red-colored letter (A or B). Lines 80 and 82 solve the color shift problem without having to press the [RESET]. This helps get around your color TV's inability to control the display of red and blue.

In the 32K version of *Rockfest* as listed, after pressing the A or B key, a menu will appear. You need only press the letter which corresponds to the group you wish to display. The graphic will then be drawn before your eyes in a fashion which will convince even the most obstinate doubting Aarons, I mean Thomases about the powerful graphics onboard your CoCo.

Want to really blow their minds? Add this line: *7 AUDIO ON:MOTOR ON* and then *RUN* the program with a prerecorded cassette tape of one of the groups listed. Press [PLAY], and the music should come ripping out of your TV speaker with these rock 'n' roll graphics. (Van Halen's "Jump" will beat "The Entertainer" any day.) You can even have these graphics displayed on your TV while playing your stereo at a party with friends. Sure, it's not MTV, but it's the next best thing.

You may be wondering why I haven't suggested that you simply use the *Rockfest* for graphic output to your line printer.

There are several reasons for this. First, some machine language drivers might crash with the *PCLEARed* graphic pages. You will have to try them to see if they will work for you. There are many screen dumps available in ads here in *the Rainbow*, and some have even been listed. The one I use usually crashes with the extra pages.

Secondly, I wanted a graphic screen dump which would not be solid print as these displays would. Don't get me wrong. These images will look great even with a line/dot matrix display of the colors. Since I was looking for graphics which could be colored in with felt tipped markers, I decided to make a second version called *The Rockfest Coloring Book* (Listing 2).

## The Coloring Book

This program recreates the same graphics, but in a strict black and white representation suitable for screen dumping. The program should fit in your 16K machine, but if you have trouble with memory, delete some of the few remaining (') remarks.

This listing does not have the stage title card, but it does have a menu. When you select a graphic, you may return to the menu by pressing [ENTER], just like on *Rockfest*. If you wish to screen dump the contents with a machine language program, then press [BREAK] and load in your screen dump program. Don't worry! Your graphic will remain intact.

The screen dump I use creates an image on a full 8½ by 11 sheet of paper which makes it ideal for coloring. The screen dump you use may allow different sizes so you can be the judge of its uses (pasting on book covers, lockers, framing, etc.). I think you will find youngsters of all ages enjoying the results, regardless of what they do with the paper graphics.

## Other Uses?

Remember last month's screen quiz programs. I mentioned that the Extended BASIC version could include a graphic reward starting in line 900. If you wish to use any of these graphics as a reward, then simply delete all lines before and after each labeled section for a given group. If you use the *Rockfest* versions, be sure to *PCLEAR* as I warned earlier.

Once you have the lines you want to use isolated (that is, all the lines before and after are gone from memory), type: *RENUM 900,10,1* and press [ENTER]. The program lines will now correspond to the required location in the screen quiz program. You may now *MERGE* the two programs as one, either using the disk command *MERGE*, or a cassette merge program such as those listed in previous *Rainbow* issues. The *INKEY$* line at the end of each graphic should be changed so that the line number after the word *THEN* is changed to *RETURN*. Voila!

You may even use the *Coloring Book* versions for merging, which do not require a *PCLEAR*. This would be advisable if you only have 16K.

## Feedback

So far, judging from the reactions of the middle and high school students who got a sneak preview of *Rockfest* and the *Coloring Book*, both are a smashing success. (The word *awesome* is usually used!)

Already, plans are underway for *Rockfest II*. A few of the graphics are already half done. (My younger cousin David and his best friend Eric have been hinting at using groups like Ozzy Osbourne, Motley Crue, Iron Maiden, Black Sabbath and a host of other "heavy metal" groups. My own personal choices would include the Beach Boys or Elvis Costello, while my dear friend Zelda will probably force me to include her friends, Village People, under threat of never giving me any more of her famous lasagna.) I'm sure many of our high school-aged readers will also have some suggestions.

In the meantime, keep those ideas coming and enjoy your rock 'n' rolling Color Computer.

| | | | |
|---|---|---|---|
| 52 | 57 | 524 | 182 |
| 96 | 24 | 606 | 173 |
| 212 | 7 | 642 | 43 |
| 246 | 105 | 720 | 186 |
| 280 | 200 | 776 | 244 |
| 338 | 189 | 828 | 95 |
| 420 | 112 | 856 | 41 |
| 458 | 224 | 880 | 50 |
| | | END | 230 |

**Listing 1:**

```
10 '****************************
12 '*   THE COCO ROCK-FEST #1   *
14 '*      BY FRED B. SCERBO    *
16 '*      COPYRIGHT (C) 1984   *
18 '****************************
20 GOTO950
22 PMODE4,1:PCLS0:SCREEN1,1
24 LINE(0,170)-(255,174),PSET,B
26 LINE(0,174)-(255,192),PSET,BF
28 PMODE3,1
30 POKE178,50:PAINT(128,2),,4
32 FORI=1TO40STEP4:IK=RND(3)+1:C
OLOR K,K::LINE(I,0)-(I,170),PSET
:LINE(254-I,0)-(254-I,170),PSET:
NEXT
34 FORI=2TO120STEP2:K=RND(3)+1:C
IRCLE(0,0),I,K,.4,0,.25:CIRCLE(2
55,0),I,K,.4,.25,.5:NEXT
36 LINE(70,48)-(182,100),PSET,BF
38 DRAW"BM108,52C3R4ND6R4BR6D6U3
R6D3U6BR6NR6D3NR6D3NR6"
40 PMODE4,1
42 FORI=96TO140STEP44
44 FOR Y=6TO10
46 CIRCLE(I,70),Y,0,.9,.15,.9
48 CIRCLE(I+11,78),Y,0,.9,.6,.8
50 NEXT Y
52 FOR Y=6TO10
54 IF I=96 THEN 56 ELSE 58
56 CIRCLE(I+33,78),Y,0,.9,.6,.8
58 CIRCLE(I+20,70),Y,0,.9
60 NEXTY
62 NEXTI
64 PMODE3,1
66 DRAW"BM76,94C2U12R4F2D2G2L4R4
F2D4BR8H2U8E2R4F2D8G2L4BR14R4NE2
L4H2U8E2R4NF2BR8D12U6R2E4NU2G4F4
D2BR4BU6R6BD6BR6U6NR4U6R6BR6"
68 DRAW"NR6D6NR4D6R6BR6R8U6L8U6R
8BR4R4ND12R4"
70 FORI=6TO120STEP16:I$=STR$(I):
Y$=STR$(256-I)
72 DRAW"BM"+I$+",188C3U4NR4U4R4D
8"
```

# CPP
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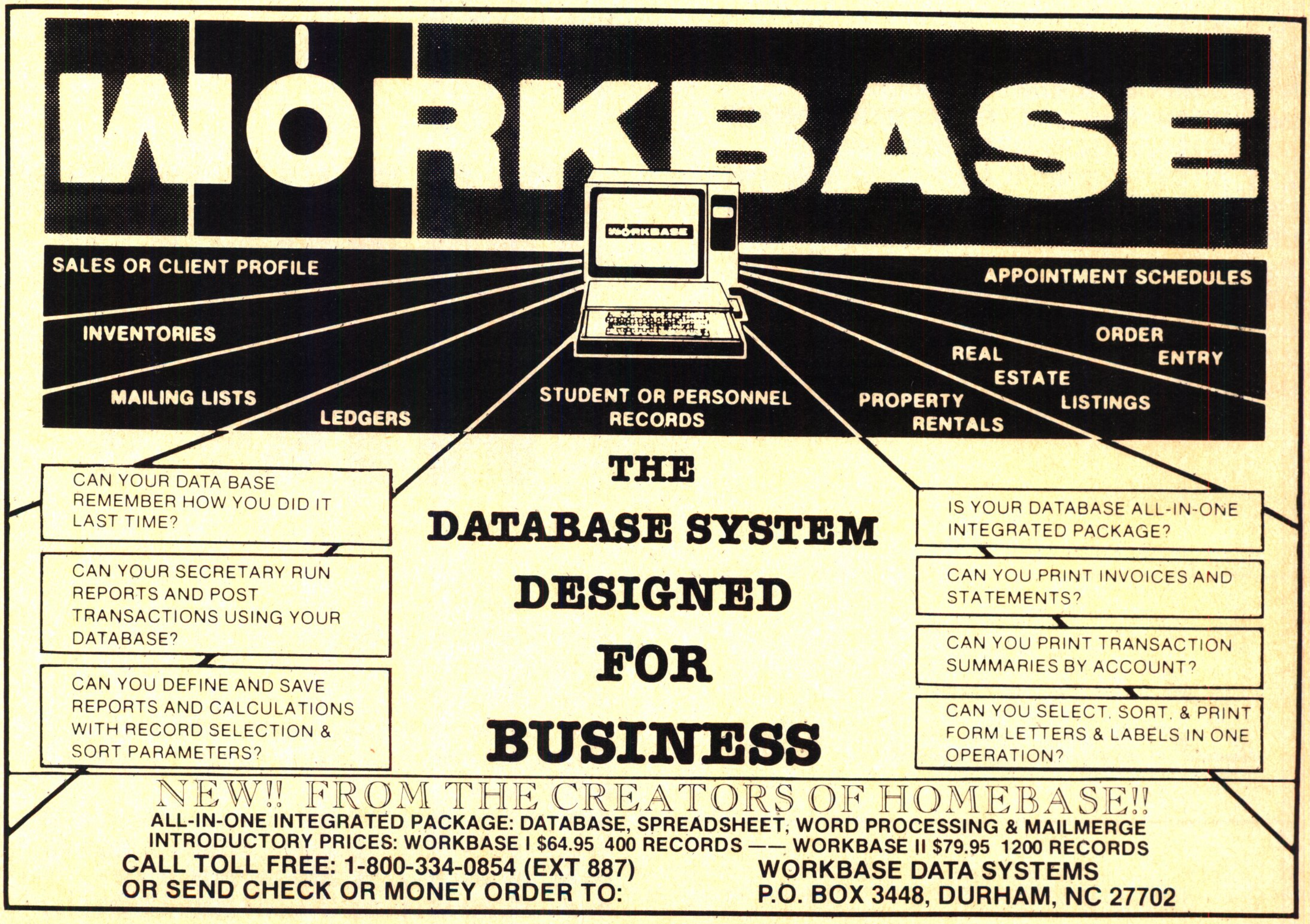
```
74 DRAW"BM"+Y$+",188C2NL6U4NL4U4
L6R2D8"
76 NEXTI
78 X$=INKEY$:IFX$="A"THEN80ELSEI
FX$="B"THEN82ELSE78
80 R=3:R$="C3":GOTO84
82 R=2:R$="C2":GOTO84
84 CLS3:PRINT@132," A) THE ROLLI
NG STONES ";
86 PRINT@164," B) ASIA"+STRING$(
15,32);
88 PRINT@196," C) QUIET RIOT"+ST
RING$(9,32);
90 PRINT@228," D) Z Z TOP"+STRIN
G$(12,32);
92 PRINT@260," E) VAN HALEN"+STR
ING$(10,32);
94 PRINT@292," F) YES"+STRING$(1
6,32);
96 PRINT@324," G) 38 SPECIAL"+ST
RING$(9,32);
98 PRINT@356," H) AC-DC"+STRING$
(14,32);
100 X$=INKEY$:IFX$=""THEN100
102 X=ASC(X$)-64:IF X<1 THEN 100
 ELSE IF X>8 THEN100
104 ON X GOTO 200,300,400,500,60
0,700,800,900
106 GOTO106
200 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3,1
202 CIRCLE(110,110),66,1,1.2,.07
,.45
204 CIRCLE(122,140),72,1,1.1,.5,
.73
206 CIRCLE(152,150),60,1,1.5,.53
,.7
208 CIRCLE(154,152),58,1,1.4,.53
,.76
210 DRAW"S4C1BM96,148DLDLU6BM154
,70R4E4R2F2R4F2R10E4M200,74"
212 FORI=0TO2:CIRCLE(238+I,150),
72,1,1.3,.5,.67:NEXT I
214 DRAW"BM130,68L4HLHLHLUHUL6G2
BD10BL6G22D2G2DGDGDLDLD2LD4L2D16
F2R2FR2E2U2E2U16EUEUEU2EU2M106,7
4"
216 DRAW"BM164,82NL4G20"
218 CIRCLE(198,180),88,1,1.3,.57
,.68
220 DRAW"BM118,138D6F2R8E2U4E2U4
E2U4E2U6E2U6E2U4E4"
222 DRAW"BM86,74H10L2H4L2U6E4R2E
4R2E2R2E2R2E2R2E4"
224 CIRCLE(134,72),44,1,1.8,.58,
.86
226 CIRCLE(180,20),24,1,.9,.6,.9
```



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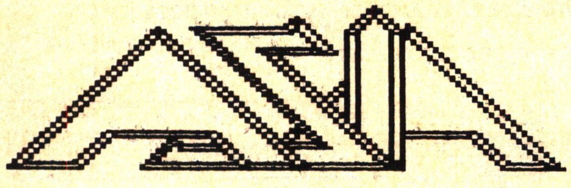
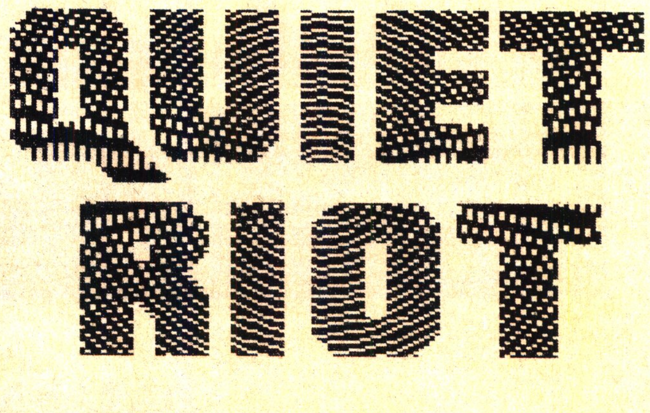
```
6
228 CIRCLE(240,0),40,1,1.1,.3,.4
4
230 CIRCLE(230,56),22,1,.7,.75,.
2
232 CIRCLE(255,152),60,1.1.5,.55
,.72
234 CIRCLE(170,104),34,1,1.4,.1,
.25
236 CIRCLE(130,60),32,1,.7,.6,.9
238 CIRCLE(182,58),24,1,.7,.65,.
95
240 DRAW"BM166,46G3L4H2BL50G8L2G
2L2G2L2F8BR122BH16F2R2F2R2F2R2F2
D2F2G4L2G2L2G2L2G6"
242 CIRCLE(180,20),16,1,.6,.4,.1
244 CIRCLE(134,18),19,1,.6,.4,.1
246 DRAW"BM124,24R4E2R2E2R4F2R2F
2R2BR24BD2R2E2R2E2R6F2R6"
248 CIRCLE(170,44),24,1,.9,.12,.
4
250 CIRCLE(132,44),25,1,.9,.12,.
4
252 CIRCLE(104,54),10,1,.9,.1,.4
5
254 CIRCLE(200,44),20,1,1.3,.13,
.4
256 PAINT(130,66),1,1
258 PAINT(140,4),R,1
260 PAINT(118,76),R,1
262 PMODE4,1:DRAW"C0BM181,152NL3
NR3D6BR8U6F4E4D6":PMODE3,1
264 DRAW"BM22,2C1R4ND8R4BR4D8U4R
6U4ND8BR6NR6D4NR4D4R6BL80BD6"
266 DRAW"ND8R6D4L6R2F4BR6U8R6D8N
L6BR6NU8R6BR6NU8R6BR6NU8BR6U8F8N
U8BR6U8R8ND2L8D8R8U4L4"
268 DRAW"BD18BL66R6U4L6U4R6BR4R4
ND8R4BR4D8R6U8NL6BR6ND8F8U8BR6NR
6D4NR4D4R6BR6R6U4L6U4R6"
270 X$=INKEY$:IFX$=CHR$(13)THEN
84 ELSE 270
```



```
300 PMODE4,1:PCLS1:PMODE4,3:PCLS
1:SCREEN1,1:PMODE3,1
302 FOR I=1 TO 255
304 DRAW"S4C3BM30,70E48F48L16H12
L38G12L16M24,72E54ND4F54L2UL3UDR
3DR2L24ER2EGL2GH12NE2L34NH2G12NH
2L24BR46NR40E12F3R11F2L14H2G7R28
"
306 DRAW"BF2BR10R15H8NR14H2R12H4
4R34E4F14L22F44NL30L2UL2UL2NL26H
44FR2FNR2HL2HR22FR2FHL2H9NU4G2L3
0HLRF45LHLHL14E6D4NG2U4BE10E8D4N
G5ND11U22E10F10D52H4U48NR2H6NU4G
6NL2D38"
308 DRAW"U22BE16E3D4NG3U4F55L22H
12L24U2R26NG2F12NG2R13NH48RFR"
310 POKE178,I
312 PAINT(46,65),,3
314 PAINT(120,24),,3
316 PAINT(156,24),,3
318 PAINT(176,40),,3
320 PAINT(83,68),,3
322 PCOPY1TO4:PCOPY2TO5
324 Y=RND(4):IF Y=3 THEN 324
326 PMODE1,1:PCLS(Y):PMODE3,1
328 IF Y<4 THEN 332
330 LINE(0,0)-(256,92),PRESET,B
332 X$=INKEY$:IFX$=CHR$(13)THEN
84 ELSE NEXT I
334 GOTO300
```



```
400 J=0
402 PMODE4,1:PCLS(J):SCREEN1,1:P
MODE3,1
404 DRAW R$
406 DRAW"S4BM20,10G8D40F8R22F8R2
0H16U40H8NL26BL8BD14D28L10U28R10
BU14BR26"
408 DRAW"D48F8R30E8U48L18D40L10U
40L18BR56D56R18U56NL18BR10D56R40
U14L20U8R20U12L20U8R20U14L40"
410 DRAW"BR46D14R16D42R20U42R16U
```

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| | |
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| CoCo Switcher | $ 39.95 |
| Elephant Disks ssdd | $ 22.95 |

| | | |
|---|---|---|
| 26-3030 OS-9 (64k) | $ 64.95 | (disk) |
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|---|---|
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| | |
|---|---|
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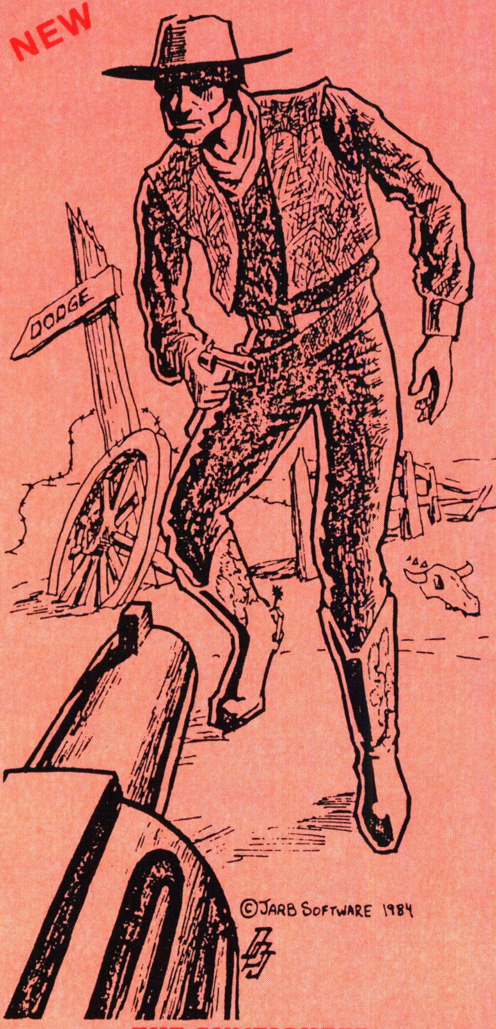
NOT FOR CoCo 2



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*BY Terry A. Steen*

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| | |
|---|---|
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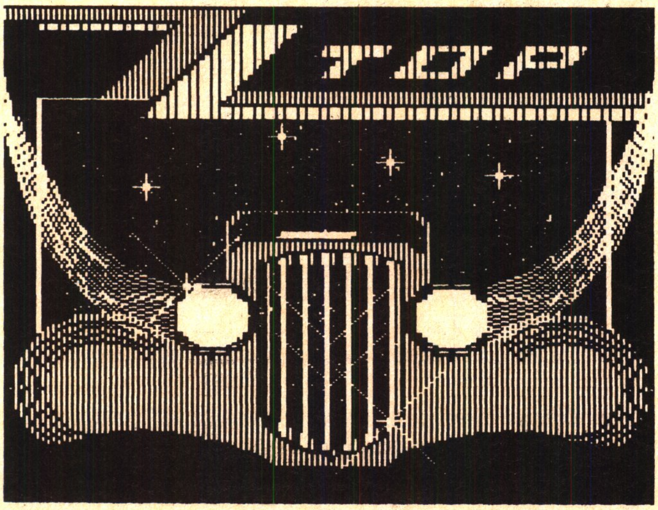
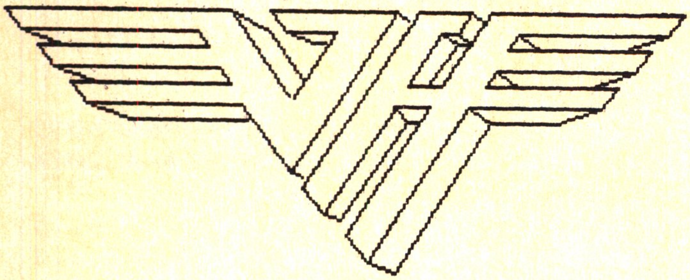
```
14L52"
412 DRAW"BD72BL156D56R18U22F10D1
2R18U22H8E8U10H8L38R18BD14D8R8U8
L8BU14BR38D56R18U56NL18BR20G8D40
F8R30E8U40H8L30R10BD42R10U28L10D
28BU42"
414 DRAW"BR36D14R16D42R20U42R16U
14L52"
416 PAINT(20,14),R,R:PAINT(70,14
),R,R:PAINT(130,14),R,R:PAINT(15
2,14),R,R:PAINT(200,14),R,R
418 PAINT(40,86),R,R:PAINT(100,8
6),R,R:PAINT(140,86),R,R:PAINT(2
00,86),R,R
420 PMODE4,1
422 FORI=2TO200STEP4:CIRCLE(128,
72),I,J,.9:NEXT
424 PMODE4,1:SCREEN1,1:PMODE3,1
426 DRAW"BM26,170C2U13F8E8ND13BR
8NR10DNR10D5NR8DNR8D5NR10DR10BU1
3BR6R14DL7ND12L7"
428 DRAW"BD12BR20U13R10DNL10D5NL
10DNL10D6BR8NU13UNR10DR10"
430 DRAW"BR16U13D6NR8DR10U7D13BR
8U13NR10DNR10D5NR8DNR8D5NR10DR10
"
432 DRAW"BR8U13NR8DNR8D5NR10DR10
U7D13BR8NU13UNR10DR10BR2BU13R14D
L7ND12L7BR20UD13U7NR10DR10U7D13"
434 DRAW"BM26,152R200DL200BD22R2
00DL200"
436 IF J=1 THEN 440
438 FOR U=1 TO 4:PCOPY U TO U+4:
NEXT U:J=1:GOTO402
440 PMODE4,1:SCREEN1,1:FORI=1TO2
00:NEXT I
442 PMODE4,5:SCREEN1,1:FORI=1 TO
200:NEXT I
444 X$=INKEY$:IF X$=CHR$(13) THE
N 84 ELSE 440
```

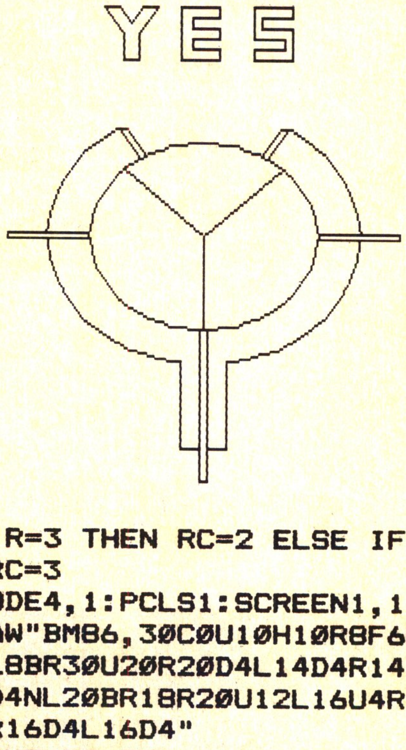


```
500 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3,1
502 DRAW"S4C1BM0,0R100G36L22E30G
4L50NU4R50E4L90U10R100G44R200U6N
L166U6L160NG6E26L24"
504 DRAW"BR30BD8G6R10G8R10E8R8E6
NL26BR8R28G14L28E14R10BG4R8G6L8E
6BH4BR34R28G10L16G4L10E14BF4R8G2
L8E2GR8"
506 PAINT(168,20),1,1
508 FORI=0TO20STEP4:LINE(128-I,1
00)-(128-I,170-I/2),PSET:LINE(12
8+I,100)-(128+I,170-I/2),PSET:NE
XT
510 CIRCLE(128,102),30,1,.3,.57,
.92
512 CIRCLE(128,140),32,1,1.1,.1,
.42
514 DRAW"BM102,100D56BR52U58
516 POKE178,43:PAINT(128,98),,1
518 PMODE3,1:FORY=0TO88STEP88:FO
RI=0TO2:CIRCLE(84+Y,120),18-I,1,
.9:NEXTI,Y
520 PMODE3,1
522 DRAW"C1BM88,106U22E6R66F6D22
BL4BU12U8H6L58G6D8E4R60F4H4L20E4
L30G4"
524 CIRCLE(44,148),36,1,.9,.4,.9
:CIRCLE(212,148),36,1,.9,.62,1.1
526 CIRCLE(60,192),54,1,.5,.67,.
9
528 CIRCLE(194,192),54,1,.5,.62,
.87
530 DRAW"BM20,168F2R6BD4BR74F4R4
4E4BU4BR70R12E4"
532 PAINT(128,176),R,1
534 PAINT(128,79),R,1
536 PAINT(128,82),1,1
538 PAINT(128,190),1,1
540 PAINT(250,2),1,1
542 POKE178,30:PAINT(40,8),,1:PA
INT(90,30),,1
544 PAINT(130,18),,1:PAINT(160,1
8),,1:PAINT(200,18),,1
546 POKE178,0:PAINT(20,4),R,1
548 PAINT(250,34),R,1
550 DRAW"BM20,126C4U90R40BR170BD
8D80"
552 PMODE4,1:FORI=1TO12:CIRCLE(7
0,0),56+I,1,1.9,.25,((38+I)/100)
:CIRCLE(186,0),56+I,1,1.9,((50-(
38+I))/100),.25:NEXT
554 FORI=22TO31STEP3:CIRCLE(44,1
48),I,0,.9,.2,.9:CIRCLE(214,148)
,I,0,.9,.62,.35:NEXTI
556 PMODE4,1:SR$="C1NE20NH20NU5N
R5NL5ND5NG20NF20"
558 DRAW"BM150,160"+SR$
560 DRAW"BM75,108"+SR$
562 FORI=1TO350:W=RND(190)+30:U=
RND(110)+45:PMODE3,1
564 IF PPOINT(W+1,U)=R+4 THEN 56
```

```
8
566 PMODE4,1:PSET(W,U)
568 NEXT I:PMODE4,1
570 SR$="C1NU5ND5NL5NR5NE2NF2NG2
NH2"
572 DRAW"BM110,50"+SR$
574 DRAW"BM150,60"+SR$
576 DRAW"BM60,70"+SR$
578 DRAW"BM190,65"+SR$
580 DRAW"BM128,130C1NH22NE22BD16
NH20NE20"
582 X$=INKEY$:IF X$=CHR$(13) THE
N 84 ELSE 582
```



```
600 PMODE4,1:PCLS0:SCREEN1,1:PMO
DE3,1:PCLS2
602 DRAW"C1BM112,66M90,32M8,32M1
4,40M78,40M82,46M20,46M26,54M86,
54M90,60M32,60M38,68M94,68M112,9
4M150,32M104,32M110,40M128,40M11
2,66"
604 DRAW"BM230,60M182,60M186,54M
236,54M242,46M190,46M194,40M248,
40M254,32M184,32M166,60M154,60M1
66,40M172,40M177,32M158,32M116,1
00M124,110M150,68M162,68M132,118
M140,128M176,68M224,68M230,60"
606 DRAW"BM14,40M30,46BM26,54M42
,60BM38,68M54,74M96,74BM112,93M1
16,96BM90,32M104,40M116,58BM150,
32M154,35"
608 DRAW"BM177,32M182,36BM172,40
M177,44BM166,40M172,44NR4M161,60
BM236,54M220,60BM248,40M232,46BM
224,68M208,74M184,74M176,68M184,
74M150,132M140,128"
610 DRAW"BM124,110M130,112M154,7
4NR4M149,68BM186,54M194,60BM194,
40M202,46BM110,40M120,44R4"
612 PAINT(30,38),3,1
614 PAINT(220,38),3,1
616 PAINT(128,118),2,1
618 PAINT(172,50),4,1
620 PAINT(168,52),4,1
622 PAINT(2,22),4,1
624 FOR U=1TO4:PCOPY U TO U+4:NE
XT U
626 PMODE3,5
628 PAINT(172,50),1,1
630 PAINT(168,52),1,1
632 PAINT(2,22),1,1
634 PMODE3,5:SCREEN1,0:FORI=1TO9
00:NEXTI
636 X$=INKEY$:IFX$=CHR$(13)THEN
84
638 PMODE4,1:SCREEN1,1:FORI=1TO9
00:NEXTI
640 X$=INKEY$:IFX$=CHR$(13)THEN
84
642 PMODE3,5:SCREEN1,1:FORI=1TO9
00:NEXTI
644 X$=INKEY$:IFX$=CHR$(13)THEN
84
646 GOTO634
```



```
700 IF R=3 THEN RC=2 ELSE IF R=2
 THEN RC=3
702 PMODE4,1:PCLS1:SCREEN1,1
704 DRAW"BM86,30C0U10H10R8F6E6R8
G10D10L8BR30U20R20D4L14D4R14D4L1
4D4R14D4NL20BR18R20U12L16U4R16U4
L20D12R16D4L16D4"
706 PAINT(90,27),0,0
708 PAINT(120,27),0,0
710 PAINT(160,27),0,0
712 CIRCLE(128,96),60,0,.6
714 DRAW"BM128,96C0ND34M169,71BM
128,96M87,71"
716 CIRCLE(128,96),82,0,.6,.85,.
67
718 DRAW"BM128,96BH30H10L4F10BM1
28,96BE30E10R4G10"
720 LINE(116,144)-(140,176),PSET
,B
722 COLOR 1,0
724 LINE(117,143)-(139,146),PSET
```

# COMPUTERIZE YOUR BUSINESS

## Save Time in Tax Preparation with COMPUTERWARE®
## Business Software for OS-9 and FLEX

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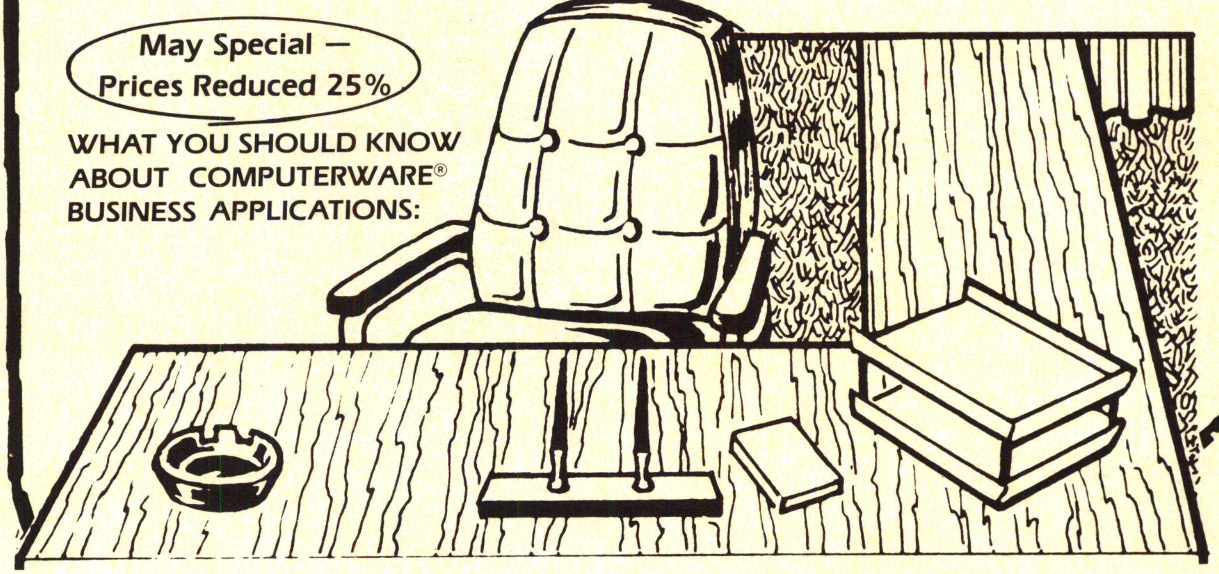
**WHAT YOU SHOULD KNOW ABOUT COMPUTERWARE® BUSINESS APPLICATIONS:**



- They have been in use for over 4 years on many 6809 sytems. This means they are well tested.
- Complete manuals accompany the systems.
- User-friendly menus make them easy to use.
- They are not accounting tutorials. They assume you know and use sound accounting principles.

**System Requirements**

- FLEX or OS-9 operating system
- 64K memory
- Computerware® Random BASIC
- Dual Disk Drives (Payroll requires double-sided drives)
- O-PAK for OS-9 systems

### GENERAL LEDGER ~~$249~~ $185

This is a comprehensive double entry accounting system with complete audit trails, closing procedures, and full reporting. The chart of accounts is flexible and the system easy to use. Reports include the General Ledger, Trial Balance, Balance Sheet, Income Statement, and Transaction Register. Your financial information is at your fingertips!

### CHECK LEDGER ~~$195~~ $150

This is a single entry bookkeeping system which allows the users to define a chart of income and expense accounts. Year-to-date totals are maintained for each account as well as complete checking account history. By just entering your checking account information, you can have always-current visibility over your income and expense ledgers. Financial statements and taxes are a snap!

### CORRESPONDENCE SYSTEM ~~$149~~ $115

We call this the People Manager. It is a very sophisticated people data base system. The system collects name and address information, provides mailing labels or reports of the entire list or any subset upon request. The power of the system lies in the 17 character special code field that is used to identify special characteristics of each person and then can be used to select subgroups for reports and labels used in special marketing or contracts. Tested with data bases of 15 to 9,000 entries this system has been in use with retailers, clubs, churches and professionals for years.

***(Sale prices good through May 31, 1984)***

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**P.O. Box 668 • Encinitas, CA 92024 • (619) 436-3512**

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### PAYROLL ~~$295~~ $225

This is the most comprehensive payroll you'll find on a microcomputer. Besides collecting key employee information, it allows entry of pay rates for standard hours, overtime, and salary. Hourly, salary, and commissioned employees may be paid weekly, bi-weekly, semi-monthly, and monthly. Two types of special monthly deductions are also accommodated. Year-to-date, quarterly, monthly and current totals are maintained. All federal reporting is done automatically and your state computations are also included.

### INVENTORY CONTROL ~~$195~~ $150

This system is designed to help the retailer, distributor, or businessman to keep control of this important factor. It stores your cost and quantity information, updates it immediately, and offers you key management reports with useful summaries at any time. With four costs, four locations, selling history, and vendor information for each item, you will always have the facts!

### ACCOUNTS PAYABLE ~~$195~~ $150

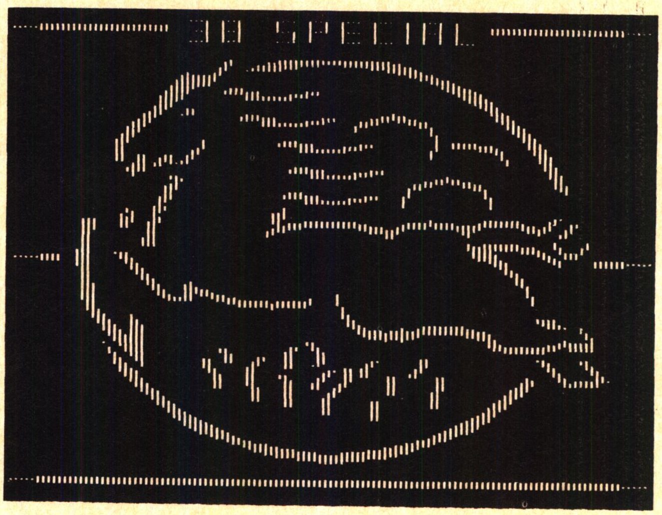
This system can give you the tools to plan your business growth by controlling expenditures and forecasting cash requirements. It helps a small business manage and track its cash liabilities by collecting vendor invoice information and reporting the business' cash commitments and payment history. Along with standard payables reports it also includes a check writer and payment forecast reports.

### ACCOUNTS RECEIVABLE ~~$149~~ $115

All businesses need to know who owes them money! This system provides reliable and timely information regarding the status of all customer accounts. You can know instantly which accounts are past due, forecast how much money to expect to receive for cash flow planning, and keep on top of your customers' credit positions. Customer name, address, credit limit, invoice, and payment information is recorded and reports of all information including customer statements are available upon your request.

**Dealer Inquiries Invited**

```
,BF
726 PAINT(140,140),0,0
728 LINE(126,131)-(130,188),PRES
ET,B
730 LINE(127,132)-(129,187),PSET
,BF
732 LINE(26,95)-(68,97),PRESET,B
734 LINE(28,96)-(66,96),PSET
736 LINE(230,95)-(188,97),PRESET
,B
738 LINE(228,96)-(190,96),PSET
740 PMODE3,1
742 PAINT(140,140),RC,4
744 PMODE4,1
746 CIRCLE(128,96),60,0,.6
748 PMODE3,1
750 CIRCLE(128,96),60,1,.6
752 DRAW"C1BM128,96ND34M169,71BM
128,96M87,71"
754 PCOPY2TO7:PCOPY3TO8
756 FOR I=1 TO 240
758 PCOPY7TO5:PCOPY8TO6:PMODE3,4
760 PAINT(128,92),1,1
762 POKE178,I
764 PAINT(84,78),,1
766 POKE178,I+2
768 PAINT(172,78),,1
770 PCOPY5TO2:PCOPY6TO3
772 X$=INKEY$:IF X$=CHR$(13) THE
N 84 ELSE NEXT I
774 GOTO756
```



```
800 PMODE4,1:PCLS0:SCREEN1,1
802 CIRCLE(128,96),94,1,.85
804 CIRCLE(128,96),90,1,.85
806 PAINT(128,18),1,1
808 DRAW"C0BM40,120NF14DNF14DNF1
4DNF14DNF14C1BU10F14U10F4D16H14"
810 PAINT(50,126),1,1
812 FORI=64TO140:LINE(200,I)-(23
0,I+12),PRESET:NEXT
```

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```
814 LINE(10,24)-(110,80),PRESET,
BF
816 PMODE3,1:FORI=0TO3:CIRCLE(12
8,96-I),94+I,3,.85,.6,.67:NEXT
818 DRAW"C4BM50,50E16LE10D2NG10D
NG10DNG10DNG10U4NR8DNR8DNR8DNR8D
R8NE8UNE8UNE8BM50,50ND8L2D8BD4BR
4E6D6LNU6LNU4LNU2D2"
820 DRAW"BR8BU4E4RNG4RD3R4NE6RE6
U3"
822 FORI=1TO5:PMODE4,1:CIRCLE(12
8,96),66+I,1,.85,.53,.6:CIRCLE(1
28,96),76+I,1,.85,.54,.55:NEXT
824 M$="R4DNL6R6DDNL4R12UR6UR4
826 DRAW"BM90,30"+M$+"BM90,31"+M
$
828 DRAW"BM96,40"+M$+"BM96,41"+M
$
830 DRAW"BM110,50"+M$+"BM110,51"
+M$
832 DRAW"BM114,60"+M$+"BM114,61"
+M$
834 DRAW"BM112,70"+M$+"BM112,71"
+M$
836 DRAW"BM106,82U4RD4RU4ED4EU4"
838 DRAW"BM72,40E2RG2RE2D2"
840 DRAW"BM48,94NF16RNF16RNF16RN
F16RF16NL4DNL3R4DNL5R2NU6RNU6RNU
6"
842 FORI=93TO95:CIRCLE(106,I),40
,1,.5,.2,.4:NEXTI
844 FORI=103TO106:CIRCLE(148,I),
20,1,1.1,.2,.48:NEXTI
846 FORI=128TO131:CIRCLE(170,I),
20,1,.4,.6,.95:NEXTI
848 FORI=122TO124:CIRCLE(199,I),
20,1,.4,.1,.38:NEXTI
850 DRAW"BM204,134NF10RNF10RNF10
RF10NR10UNR10UR10NH8RNH8RNH8RH8B
L6BU4NR8UNR8UNR8UR8NH5UNH5UNH5"
852 FORI=92TO94:CIRCLE(127,I),30
,1,.4,.6,.9:CIRCLE(164,I+8),26,1
,.8,.65,.85:CIRCLE(190,I+4),28,1
,.6,.67,.85
854 CIRCLE(190,I+14),30,1,.6,.7,
.9:CIRCLE(178,I+50),30,1,1.8,.75
,.9:CIRCLE(180,I+53),30,1,1.8,.7
5,.9:NEXTI
856 DRAW"BM204,118NR6DR6DL4R6DL4
R6BM204,84NE5RNE5RNE5RNE5BR4BD2N
E5RNE5RNE5RNE5BD2BL4F4R4E4DG4L4H
4DF4R4E4"
858 FORI=1TO3:CIRCLE(170,72+I),1
7,1,.6,.5,.99:CIRCLE(150,48+I),1
7,1,.6,.6,1.1:CIRCLE(177,58+I),1
7,1,.6,.7,.99:NEXT
860 PMODE4,1
862 FORY=0TO176STEP176:FORI=0TO1
```

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- **THE SPREADSHEET ZAPPER** bridges the gap between the great computational power of Radio Shack's Spectaculator and high quality graphical displays. A picture is worth more than 1000 numbers!
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- The **SPREADSHEET ZAPPER** converts those nasty Spectaculator data files (ROM PAK or Disk) to data files that are 100% compatible with Southern Software Systems' graphical display programs—The **BAR ZAPPER, THE PIE ZAPPER,** and **THE GRAPH ZAPPER.**
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- **BAR ZAPPER** allows for 26 bars.
- **THE GRAPH ZAPPER** plots line graphs of data and equations.
- High resolution graphics with on screen numbers and labels, with or without grids.
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- Detailed user's guide for all features.
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- Low res, building block graphs can't compare.
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***All programs require Extended Basic and are compatible with 64K memory.***

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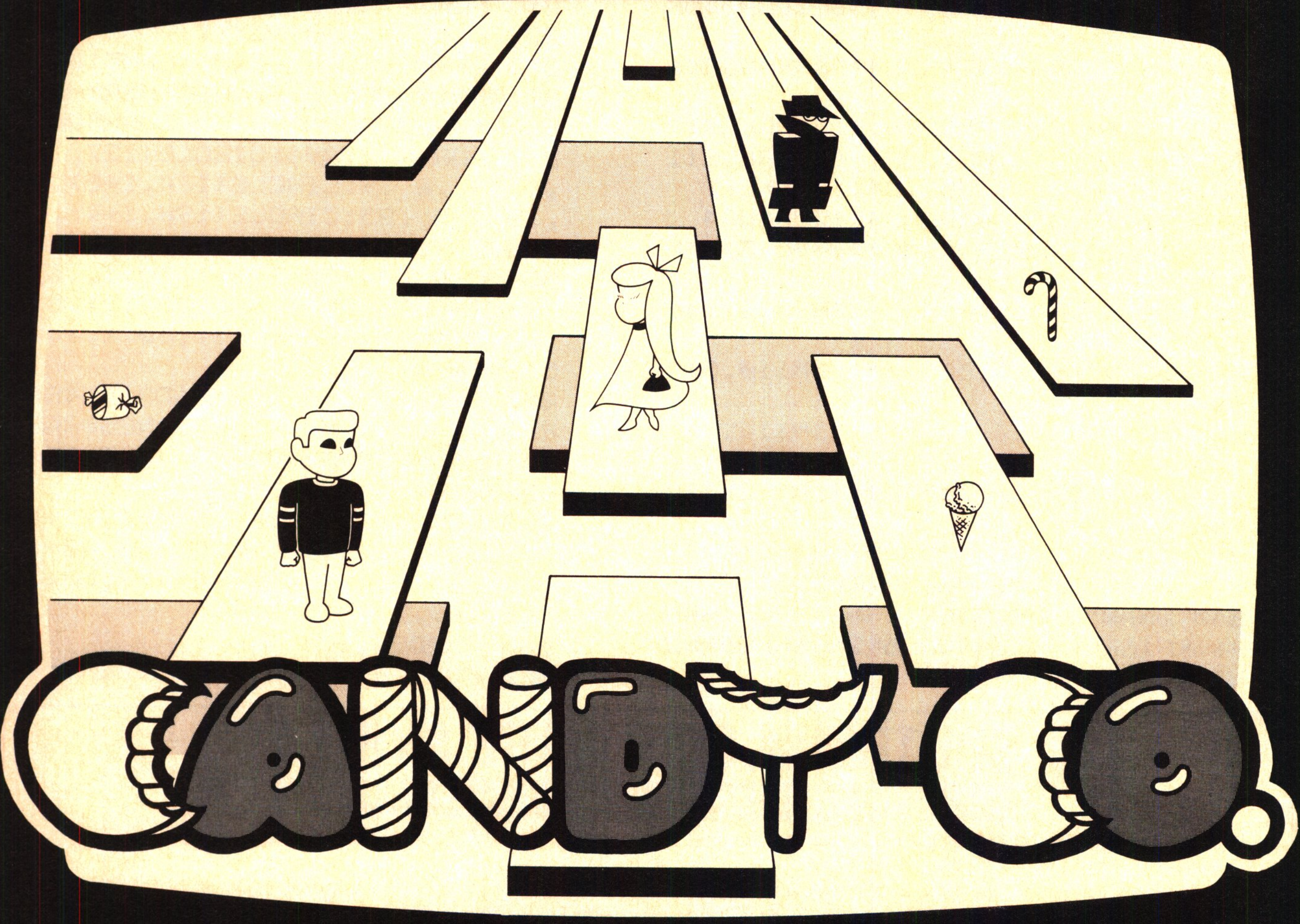
# Setting The Standards



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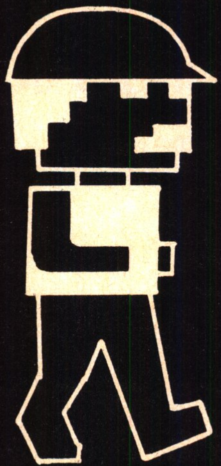

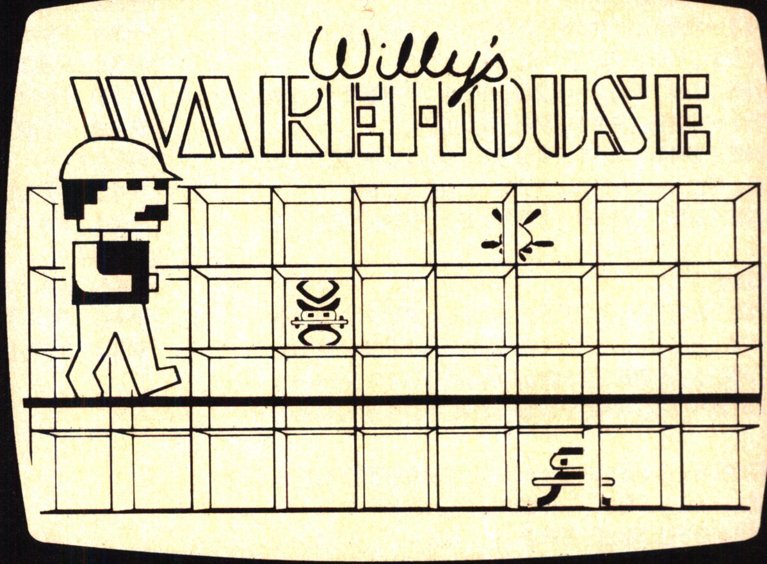

## *Willy's* WAREHOUSE

*© 1984*

Another exciting original arcade action game. Help Willy stock the warehouse while keeping up with incoming orders. Watch out for the antagonists who intend to make your day long.

Excellent graphics and sound effects. 100% ML, 1 or 2 players, demonstration mode, selectable difficulty, joystick or keyboard input, pause feature and high score list with name entry. For 32K CoCo and TDP-100.

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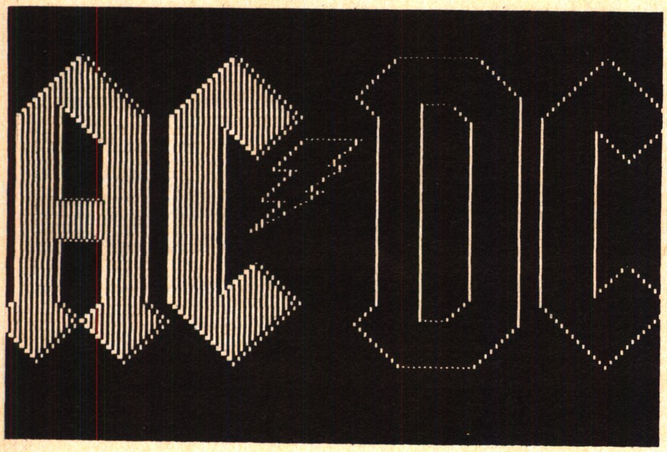
```
0STEP10:LINE(10+I,Y+7-I/10)-(245
-I,Y+7+I/10),PSET,BF:NEXTI,Y
864 FORI=1TO256STEP2:LINE(I,0)-(
I,192),PRESET:NEXT
866 FORI=84TO87:I$=STR$(I)
868 DRAW"BM"+I$+",146S5U4H3U3BR6
BDU3H2BD16BR10U4H2U4E4BR6BD6F2D8
BU12U4E3BU2BR4F4D2G2BD2BR4G4D2BD
4BR3ND4E7U4BR6NE3D3BR8ND6BR6E4U2
BR4BD6D4G2D4BL18BD4U6S4"
870 NEXTI
872 FORI=80TO177STEP2:LINE(I,128
)-(I,158),PRESET:NEXT
874 LINE(10,96)-(28,96),PSET:LIN
E(20,95)-(28,97),PSET,BF
876 LINE(245,96)-(225,96),PSET:L
INE(225,95)-(235,97),PSET,BF
878 LINE(68,18)-(185,0),PRESET,B
F
880 PMODE3,1
882 DRAW"BM74,12C4R6U4NL4U4NL6BR
6D8R6U4NL6U4NL6BR14NR6D4R6D4NL6B
R6U8R6D4L6D4BR12NR6U4NR6U4R6BR6N
R6D8R6BR6NU8BR6U8R6D4NL6D4BR6NU8
R6"
884 PMODE4,1:FORI=68TO184STEP2:L
INE(I,0)-(I,18),PRESET:NEXT
886 FORI=0TO30STEP2:LINE(I,93)-(
I,97),PRESET:LINE(I+224,93)-(I+2
24,97),PRESET:NEXT
888 X$=INKEY$:IFX$=CHR$(13) THEN
 84 ELSE 888
```



```
900 PMODE3,1
902 PCLS1:SCREEN1,0
904 FOR Y=1 TO 255
906 W=RND(2)+2:Q=RND(2)-1
908 PMODE3,5:PCLS1
910 A$="L8D12F4G8H8E4U36E12F12D3
6F4G8H8E4U12BU8U10H8D18R8"
912 C$="H12U36E12F12G8H6D32E6F8G
12"
914 D$="H8E4U36H4E8R14F8D44G8L14
BU9BR4U42R5F4D34G4L5"
916 DRAW "C2"
918 DRAW"S8BM42,90"+A$
920 DRAW"BM90,138"+C$
922 DRAW"BM150,138"+D$
924 DRAW"BM226,138"+C$
926 DRAW"BM136,50L10G6R4G6R4G6M1
22,70L3M130,60L3M136,50S4"
928 POKE178,Y
930 PAINT(30,30),,2
932 PAINT(90,24),,2
934 PAINT(120,54),,2
936 PAINT(150,24),,2
938 PAINT(230,24),,2
940 FOR U=1 TO 4:PCOPY U+4 TO U:
NEXT U
942 PMODE 3,1:SCREEN1,Q
944 X$=INKEY$:IF X$=CHR$(13) THE
N 84
946 NEXT Y
948 GOTO900
950 PCLEAR8:GOTO22
```

| | | | |
|---|---|---|---|
| 46 | 170 | 506 | 134 |
| 126 | 109 | 618 | 190 |
| 162 | 178 | 720 | 136 |
| 306 | 249 | 754 | 122 |
| 330 | 188 | 776 | 30 |
| 428 | 50 | END | 23 |

Listing 2:

```
10 '****************************
12 '*  THE ROCK-FEST COLORING  *
14 '*     BOOK VERSION 1.0     *
16 '*     BY FRED B. SCERBO    *
18 '*     COPYRIGHT (C) 1984   *
20 '****************************
22 CLS3
24 PRINT@68,"ROCK-FEST COLORING
BOOK";
26 PRINT@132," A) THE ROLLING ST
ONES ";
28 PRINT@164," B) ASIA"+STRING$(
15,32);
30 PRINT@196," C) QUIET RIOT"+ST
RING$(9,32);
32 PRINT@228," D) Z Z TOP"+STRIN
G$(12,32);
34 PRINT@260," E) VAN HALEN"+STR
ING$(10,32);
36 PRINT@292," F) YES"+STRING$(1
6,32);
38 PRINT@324," G) 38 SPECIAL"+ST
RING$(9,32);
40 PRINT@356," H) AC-DC"+STRING$
(14,32);
```

★ COLOR COMPUTER WORD PROCESSOR ★

# Elite•Word™

## Also Available On OS-9

*THE SECOND GENERATION WORD PROCESSOR IS NOW . . . ELITE•WORD has many new features not found in other word processors for the Color Computer. ELITE•WORD is an all machine language, high performance, Full Screen Editor which offers an ease of use that is simply incredible. ELITE•WORD also offers a printed output flexibility that can handle your sophisticated home and business applications. ELITE•WORD is waiting to work for you.*

**MAJOR Features include:**

- **ALL Machine Language for speed**
- **Handsome Vinyl Binder**
- **Comprehensive Manual Included**
- **User Friendly (really)**
- **Top screen line reserved for command prompts, HELP messages, and status information**
- **Two text entry modes: Insert and Exchange**
- Edit 2 files simultaneously (OS-9 Only)
- Delete character under cursor
- Backspace and delete one character
- Delete entire screen line
- Rewrite entire screen
- Page Forward through text
- Page Backward through text
- Mark present line for automatic centering on output
- Insert new text (Insert mode)
- Type over old text (Exchange mode)
- Screen Display is 32x19 in normal text editing modes
- Screen Display is High-Res 64x19 when used to display final text; including page breaks and justification
- Screen Display in all modes is true Upper/Lower case characters with descenders
- Over 13.5K file size in 32K machines
- Continuous memory display
- Save text file (disk or tape)
- Load text file (disk or tape)
- All I/O errors trapped and recoverable
- Jump to beginning or end of text
- Find any string of characters in text
- Global replacement of one string in text for another
- **True block-text Move command**
- **Smooth cursor movement over text in any direction (including vertical)**
- **Smooth screen scroll for easier proof reading**
- **Auto Key-Repeat will automatically repeat any key that is held down**
- **Easy generation of ASCII files**
- **VIEW function permits high-res screen display of final text before it's printed; including right-side justification and page breaks**
- **VARIABLE TEXT MERGE allows for generation of standard form type letters that appear to be personally prepared for each reader**
- **INCLUDE feature (disk only) permits the inclusion of many other files within one large document. Total document will have sequential page numbering**
- **EXCELLENT FOR PROGRAM EDITING AND WORD PROCESSING.**

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|---|---|
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| RS Disk | $59.95 |
| OS-9 Disk | $79.95 |
| OS-9 & RS Disk | $109.95 |

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- **Type ahead keyboard buffer NEVER misses a character**
- **Optional screen display of all carriage returns <cr>**
- **Fast Disk I/O . . . No loading of overlay files to slow program operation**
- **User HELP display available**
- **Automatic screen Word-Wrap; even while inserting new text**
- Block-text move, copy or delete
- Display/Change default disk drive number (disk only)
- Display disk directory (disk only)
- Display Free disk space available
- Software remembers last file name Saved or Loaded and will write to that file by default if desired
- Dynamic margin changes within text
- Select Top margin, Bottom margin, and Page length
- Choose number of duplicate copies
- Page Pause, for single sheet users, if desired
- Optional page numbering begins with any selected page number
- Printer Font codes are user definable
- All printer format options may be changed dynamically within text
- Any string of HEX characters may be imbedded within text to send any special control codes to your printer
- An Eject (top of form) command may be inserted within text
- Variable Text Merge symbols may be inserted anywhere within text
- All machine language; 32K and Extended Basic required for ROM-call routines

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OS-9 is a trademark of Microware and Motorola.

*Elite Software*

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

**"I was more than satisfied with Elite*Word. Before I started the review, I thought that it would be just another program that would copy most of what others had done and add a few whistles and bells. After the review, I would not hesitate to compare it with the two best selling CoCo word processors. And my comparison places it at the top of the list."**

**- A. Buddy Hogan, Rainbow**

```
42 X$=INKEY$:IFX$=""THEN42
44 X=ASC(X$)-64:IF X<1 THEN 42 E
LSE IF X>8 THEN42
46 ON X GOTO 98,200,300,398,500,
598,700,800
48 '
50 '
68 ' THE ROLLING STONES
98 PMODE4,1:PCLS1:SCREEN1,1:PMOD
E3,1
100 CIRCLE(110,110),66,1,1.2,.07
,.45
102 CIRCLE(122,140),72,1,1.1,.5,
.73
104 CIRCLE(152,150),60,1,1.5,.53
,.7
106 CIRCLE(154,152),58,1,1.4,.53
,.76
108 DRAW"S4C1BM96,148DLDLU6BM154
,70R4E4R2F2R4F2R10E4M200,74"
110 FORI=0TO2:CIRCLE(238+I,150),
72,1,1.3,.5,.67:NEXT I
112 DRAW"BM130,68L4HLHLHLUHUL6G2
BD10BL6G22D2G2DGDGDLDLD2LD4L2D16
F2R2FR2E2U2E2U16EUEUEU2EU2M106,7
4"
114 DRAW"BM164,82NL4G20"
116 CIRCLE(198,180),88,1,1.3,.57
,.68
118 DRAW"BM118,138D6F2R8E2U4E2U4
E2U4E2U6E2U6E2U4E4"
120 DRAW"BM86,74H10L2H4L2U6E4R2E
4R2E2R2E2R2E2R2E4"
122 CIRCLE(134,72),44,1,1.8,.58,
.86
124 CIRCLE(180,20),24,1,.9,.6,.9
6
126 CIRCLE(240,0),40,1,1.1,.3,.4
4
128 CIRCLE(230,56),22,1,.7,.75,.
2
130 CIRCLE(255,152),60,1,1.5,.55
,.72
132 CIRCLE(170,104),34,1,1.4,.1,
.25
134 CIRCLE(130,60),32,1,.7,.6,.9
136 CIRCLE(182,58),24,1,.7,.65,.
95
138 DRAW"BM166,46G3L4H2BL50G8L2G
2L2G2L2F8BR122BH16F2R2F2R2F2R2F2
D2F2G4L2G2L2G2L2G6"
140 CIRCLE(180,20),16,1,.6,.4,.1
142 CIRCLE(134,18),19,1,.6,.4,.1
144 DRAW"BM124,24R4E2R2E2R4F2R2F
2R2BR24BD2R2E2R2E2R6F2R6
146 CIRCLE(170,44),24,1,.9,.12,.
4
148 CIRCLE(132,44),25,1,.9,.12,.
4
150 CIRCLE(104,54),10,1,.9,.1,.4
5
152 CIRCLE(200,44),20,1,1.3,.13,
.4
154 PAINT(130,66),1,1
156 PMODE4,1:DRAW"C0BM181,152NL3
NR3D6BR8U6F4E4D6":PMODE3,1
158 DRAW"BM22,2C1R4ND8R4BR4D8U4R
6U4ND8BR6NR6D4NR4D4R6BL80BD6"
160 DRAW"ND8R6D4L6R2F4BR6U8R6D8N
L6BR6NU8R6BR6NU8R6BR6NU8BR6U8F8N
U8BR6U8R8ND2L8D8R8U4L4"
162 DRAW"BD18BL66R6U4L6U4R6BR4R4
ND8R4BR4D8R6U8NL6BR6ND8F8U8BR6NR
6D4NR4D4R6BR6R6U4L6U4R6"
164 X$=INKEY$:IFX$=CHR$(13)THEN
26 ELSE 164
166 '
168 '
198 'ASIA
200 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3,1
202 DRAW"S4C1BM30,120E48F48L16H1
2L38G12L16M24,122E54ND4F54L2UL3U
DR3DR2L24ER2EGL2GH12NE2L34NH2G12
NH2L24BR46NR40E12F3R11F2L14H2G7R
28" 204 DRAW"BF2BR10R15H8NR14H2R
12H44R34E4F14L22F44NL30L2UL2UL2N
L26H44FR2FNR2HL2HR22FR2FHL2H9NU4
G2L30HLRF45LHLHL14E6D4NG2U4BE10E
8D4NG5ND11U22E10F10D52H4U48NR2H6
NU4G6NL2D38"
206 DRAW"U22BE16E3D4NG3U4F55L22H
12L24U2R26NG2F12NG2R13NH48RFR"
208 LINE(0,46)-(256,148),PRESET,
B
210 X$=INKEY$:IFX$=CHR$(13)THEN
26 ELSE 210
212 '
214 '
300 ' QUIET RIOT
302 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3,1
304 DRAW "C1"
306 DRAW"S4BM20,10G8D40F8R22F8R2
0H16U40H8NL26BL8BD14D28L10U28R10
BU14BR26"
308 DRAW"D48F8R30E8U48L18D40L10U
40L18BR56D56R18U56NL18BR10D56R40
U14L20U8R20U12L20U8R20U14L40"
310 DRAW"BR46D14R16D42R20U42R16U
14L52"
312 DRAW"BD72BL156D56R18U22F10D1
2R18U22H8E8U10H8L38R18BD14D8R8U8
L8BU14BR38D56R18U56NL18BR20G8D40
F8R30E8U40H8L30R10BD42R10U28L10D
28BU42"
314 DRAW"BR36D14R16D42R20U42R16U
14L52"
316 PMODE4,1:SCREEN1,1:PMODE3,1
318 DRAW"BM26,170C1U13F8E8ND13BR
```

★ COLOR COMPUTER WORKSHEET ★

# Elite•Calc™

*NOW . . . The worksheet calculator program you've been waiting for is waiting to work for you. ELITE•CALC is a powerful, full featured worksheet calculator designed especially for the Color Computer. Answer "what if" questions, prepare reports, maintain records and perform other tasks that, until now, required sophisticated business computers. ELITE•CALC™ is a serious tool for those who want to do more than play games with their Color Computer.*

**Features include:**

- Single character commands
- Help Displays
- Enter text or formulas to 255 characters long
- Repeat text entries
- 255 maximum rows
- 255 maximum columns
- Available memory always displayed
- Rapid Entry modes for text and data
- Selectable Automatic Cursor movement
- Insert, Delete, Move entire rows or columns
- Replicate one cell to fill a row or column with selectable formula adjustment
- All machine language for speed
- Extended BASIC required for ROM routine calls
- Automatic memory size detection for 16K, 32K or 64K
- > 20K bytes, storage available in 32K systems
- BASIC style formulas
- Math Operators: +, −, X, /, ↑, (, ), =
- Relation Operators: =, >, <, < =, > =, < >
- Logic Operations: AND, OR, NOT
- Conditional Formula: IF . . . THEN . . . ELSE
- Trig Functions: SIN, COS, TAN, ATN

- **EASY TO USE**
- **INDIVIDUAL CELL FORMULAS**
- **COPY BLOCKS OF CELLS**
- **FULL CELL-EDIT CAPABILITY**
- **COMPATIBLE WITH ALL PRINTERS**
- **EASY 132 COLUMN PAGE WIDTH**
- **CHANGEABLE BAUD RATES**
- **GRAPH FORMAT FOR BAR CHARTS**
- **SORT IN ASCENDING OR DESCENDING ORDER**
- **COMPREHENSIVE MANUAL INCLUDED**
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- **HANDSOME VINYL BINDER**

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- Log Functions: LOG, EXP, SQR.
- Misc. Functions: INT, FX, ABS, SGN.
- Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP
- Nine digit precision
- Definable constant table
- User definable printer set-up commands
- Individual column width settings
- Adjustable row height to insert blank lines without wasting memory
- Hide columns or rows
- Alternate print font selectable on cell by cell basis
- Display/Print formats set by cell, row, or column
- Dollar format, comma grouping; prefix or postfix sign
- Scientific notation, fixed point and integer formats
- Left and Right cell contents justification
- Full page formatting
- All formats stored with worksheet on disk(tape)
- Save & Load Disk(tape) files in compact memory form
- Scan disk directories
- Output ASCII file for word processor input compatibility
- Memory resident code . . . no repeated disk calls

Sample worksheets included

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*"Elite∗Calc is a great spreadsheet program! This professional quality program has the performance required for serious home applications as well as small businesses."*

*Stuart Hawkinson, Rainbow*

*"Truly one of the best programs I have seen."*

*John Steiner, Micro*

*"Elite∗Calc is an extremely powerful worksheet . . . "*

*Jack Lane, Color Micro Journal*

*"Bruce Cook's Elite∗Calc is a very fine program indeed; potentially one of the great Color Computer Programs." " . . . a very impressive product."*

*Scott L. Norman, Hot CoCo*

```
8NR10DNR10D5NR8DNR8D5NR10DR10BU1
3BR6R14DL7ND12L7"
320 DRAW"BD12BR20U13R10DNL10D5NL
10DNL10D6BR8NU13UNR10DR10
322 DRAW"BR16U13D6NR8DR10U7D13BR
8U13NR10DNR10D5NR8DNR8D5NR10DR10
"
324 DRAW"BR8U13NR8DNR8D5NR10DR10
U7D13BR8NU13UNR10DR10BR2BU13R14D
L7ND12L7BR20UD13U7NR10DR10U7D13
326 DRAW"BM26,152R200DL200BD22R2
00DL200"
328 X$=INKEY$:IF X$=CHR$(13) THE
N 26 ELSE 328
330 '
332 '
398 'ZZTOP
400 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3,1
402 DRAW"S4C1BM0,0R100G36L22E30G
4L50NU4R50E4L90U10R100G44R200U6N
L166U6L160NG6E26L24"
404 DRAW"BR30BD8G6R10G8R10E8R8E6
NL26BR8R28G14L28E14R10BG4R8G6L8E
6BH4BR34R28G10L16G4L10E14BF4R8G2
L8E2"
406 FORI=0TO20STEP4:LINE(128-I,1
00)-(128-I,170-I/2),PSET:LINE(12
8+I,100)-(128+I,170-I/2),PSET:NE
XT
408 CIRCLE(128,102),30,1,.3,.57,
.92
410 CIRCLE(128,140),32,1,1.1,.1,
.42
412 DRAW"BM102,100D56BR52U58
414 POKE178,43:PAINT(128,98),,1
416 PMODE3,1:FORY=0TO88STEP88:FO
RI=0TO2:CIRCLE(84+Y,120),18-I,1,
.9:NEXTI,Y
418 PMODE3,1
420 DRAW"C1BM88,106U22E6R66F6D22
BL4BU12U8H6L58G6D8E4R60F4H4L20E4
L30G4
422 CIRCLE(44,148),36,1,.9,.4,.9
:CIRCLE(212,148),36,1,.9,.62,1.1
424 CIRCLE(60,192),54,1,.5,.67,.
9
426 CIRCLE(194,192),54,1,.5,.62,
.87
428 DRAW"BM20,168F2R6BD4BR74F4R4
4E4BU4BR70R12E4"
430 DRAW"BM20,126C1U90R40BR170BD
8D80"
432 PMODE4,1:FORI=1TO12:CIRCLE(7
0,0),56+I,0,1.9,.25,((38+I)/100)
:CIRCLE(186,0),56+I,0,1.9,((50-(
38+I))/100),.25:NEXT
434 SR$="C0NE20NH20NU5NR5NL5ND5N
G20NF20"
436 DRAW"BM150,160"+SR$
```

```
438 DRAW"BM75,108"+SR$
440 LINE(0,0)-(255,192),PSET,B
442 DRAW"BM128,130C1NH22NE22BD16
NH20NE20"
444 X$=INKEY$:IF X$=CHR$(13) THE
N 26 ELSE 444
446 '
448 '
498 ' VAN HALEN
500 PMODE4,1:PCLS1:SCREEN1,1
502 DRAW"C0BM112,66M90,32M8,32M1
4,40M78,40M82,46M20,46M26,54M86,
54M90,60M32,60M38,68M94,68M112,9
4M150,32M104,32M110,40M128,40M11
2,66"
504 DRAW"BM230,60M182,60M186,54M
236,54M242,46M190,46M194,40M248,
40M254,32M184,32M166,60M154,60M1
66,40M172,40M177,32M158,32M116,1
00M124,110M150,68M162,68M132,118
M140,128M176,68M224,68M230,60"
506 DRAW"BM14,40M30,46BM26,54M42
,60BM38,68M54,74M96,74BM112,93M1
16,96BM90,32M104,40M116,58BM150,
32M154,35"
508 DRAW"BM177,32M182,36BM172,40
M177,44BM166,40M172,44NR4M161,60
BM236,54M220,60BM248,40M232,46BM
224,68M208,74M184,74M176,68M184,
74M150,132M140,128"
510 DRAW"BM124,110M130,112M154,7
4NR4M149,68BM186,54M194,60BM194,
40M202,46BM110,40M120,44R4"
512 X$=INKEY$:IFX$=CHR$(13)THEN
26 ELSE 512
514 '
516 '
598 ' YES
600 PMODE4,1:PCLS1:SCREEN1,1
602 DRAW"S4BM86,30C0U10H10R8F6E6
R8G10D10L8BR30U20R20D4L14D4R14D4
L14D4R14D4NL20BR18R20U12L16U4R16
U4L20D12R16D4L16D4"
604 CIRCLE(128,96),60,0,.6
606 DRAW"BM128,96C0ND34M169,71BM
128,96M87,71"
608 CIRCLE(128,96),82,0,.6,.85,.
67
610 DRAW"BM128,96BH30H10L4F10BM1
28,96BE30E10R4G10"
612 LINE(116,144)-(140,176),PSET
,B
614 COLOR 1,0
616 LINE(117,143)-(139,146),PSET
,BF
618 LINE(126,131)-(130,188),PRES
ET,B
620 LINE(127,132)-(129,187),PSET
,BF
622 LINE(26,95)-(68,97),PRESET,B
```

★ COLOR COMPUTER DATA BASE MANAGER ★

# Elite•File™

*THIS IS IT! ELITE•FILE is the full-featured, all machine language, Data Base Manager, that Color Computer users have been waiting for. From the same author that brought you ELITE•CALC, ELITE•FILE is for everyone who needs to store and recall information. You specify what to store, and what to retrieve. ELITE•FILE gives you total flexibility. ELITE•FILE is a relational Data Base Manager with all the editing and repeat formatting features that are typically found only on much larger computer systems, but priced for Color Computer users. It's "user friendly" command structure makes it simple to use even for those who don't write computer programs. ELITE•FILE is waiting to work for you.*

Features include:

- Compatible with ELITE•CALC and ELITE•WORD ASCII files
- User friendly combination of Menu driven input and single key commands
- Up to 255 named fields per record
- Up to 255 characters per field
- Up to 2000 characters per record
- Up to 4000 records per file
- Supports multiple drives
- Nested subfield definitions
- Up to eight fields in primary key
- Copy record definition from file to file
- View record definition
- Input records with easy to use field name format display
- Edit records with full screen "type over" editor
- Copy records to repeat identical data
- Scan mode for quick data retrieval
- Locate any record by field contents
- Load ELITE•CALC spread sheets into random access data files
- User setable print formats
- TAB, VTAB, CR, PAGE, text, hex print controls
- Join up to four subfile records to extend data record for print
- Create "Variable Text Insert" files for ELITE•WORD
- Produce repetitive reports with Retrieval Programs written on ELITE•WORD
- Refile data into new record structures

★ ALL MACHINE LANGUAGE

★ FLEXIBLE, USER DEFINED DATA RECORD STRUCTURES

★ 16 FILES CAN BE HANDLED AT THE SAME TIME FOR 64K RECORD CAPACITY!

★ EDIT, SCAN, SORT, SELECT RECORDS

★ OUTPUT REPORTS TO SCREEN, PRINTER, OR ASCII DISK FILE

★ PLACE DATA BY FIELD NAME, WITH CUSTOM TEXT, ANYWHERE ON THE PRINTED PAGE

★ COMPATIBLE WITH ALL PRINTERS

★ COMPREHENSIVE MANUAL

★ HANDSOME VINYL BINDER

THE BEST FOR ONLY

**$74.50**

- Disk Only
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- Thousands of applications:
  - —Mailing List
  - —Inventory
  - —Record Collection Index
  - —Phone Number Reference
  - —Order Entry/Invoice
  - —Expense Records
  - —Recipe Files
  - —Study Note Retrieval
  - —Customer Files
  - —Check Book Register
  - —Library Catalog
  - —Appointment Calendar
  - —Yours
- Data, field definitions, indices stored on a single file
- List disk directories, change default drive and "kill" files without leaving ELITE•FILE
- Memory resident, no program overlays from disk
- Minimum 32K, Disk Basic required
- Single program performs all features
- Data files accessible from BASIC programs
- Project any subset of fields in any order for the printed output
- Select specific records by field content with full logic combination capabilities
- Sort records in ascending or descending order by any field
- Calculate values from combinations of field contents
- Math operators: +, —, *, /, (, )
- Display or print column totals

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*From the creators of: ZAKSUND • COLOR TEXTSET I • COLOR TEXTSET II • INTER*
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*DISK & TAPE COPY • ANIMALS • BODY PARTS • TAPE COPY and many other fine programs*

```
624 LINE(28,96)-(66,96),PSET
626 LINE(230,95)-(188,97),PRESET
,B
628 LINE(228,96)-(190,96),PSET
630 X$=INKEY$:IF X$=CHR$(13) THE
N 26 ELSE 630
632 '
634 '
698 '38 SPECIAL
700 PMODE4,1:PCLS1:SCREEN1,1
702 CIRCLE(128,96),94,0,.85
704 CIRCLE(128,96),90,0,.85
706 PAINT(128,18),0,0
708 DRAW"C1BM40,120NF14DNF14DNF1
4DNF14DNF14C0BU10F14U10F4D16H14"
710 PAINT(50,126),0,0
712 COLOR0,1:FORI=64TO140:LINE(2
00,I)-(230,I+12),PRESET:NEXT
714 LINE(10,24)-(110,80),PRESET,
BF
716 PMODE3,1:FORI=0TO3:CIRCLE(12
8,96-I),94+I,1,.85,.6,.67:NEXT
718 DRAW"C1BM50,50E16LE10D2NG10D
NG10DNG10DNG10U4NR8DNR8DNR8DNR8D
R8NE8UNE8UNE8BM50,50ND8L2D8BD4BR
4E6D6LNU6LNU4LNU2D2"
720 DRAW"BR8BU4E4RNG4RD3R4NE6RE6
U3"
722 FORI=1TO5:PMODE3,1:CIRCLE(12
8,96),66+I,1,.85,.53,.6:CIRCLE(1
28,96),76+I,1,.85,.54,.55:NEXT
724 M$="C1R4DNL6R6DDNL4R12UR6UR4
726 DRAW"BM90,30"+M$+"BM90,31"+M
$
728 DRAW"BM96,40"+M$+"BM96,41"+M
$
730 DRAW"BM110,50"+M$+"BM110,51"
+M$
732 DRAW"BM114,60"+M$+"BM114,61"
+M$
734 DRAW"BM112,70"+M$+"BM112,71"
+M$
736 DRAW"BM106,82U4RD4RU4ED4EU4"
738 DRAW"BM72,40E2RG2RE2D2"
740 DRAW"BM48,94NF16RNF16RNF16RN
F16RF16NL4DNL3R4DNL5R2NU6RNU6RNU
6"
742 FORI=93TO95:CIRCLE(106,I),40
,1,.5,.2,.4:NEXTI
744 FORI=103TO106:CIRCLE(148,I),
20,1,1.1,.2,.48:NEXTI
746 FORI=128TO131:CIRCLE(170,I),
20,1,.4,.6,.95:NEXTI
748 FORI=122TO124:CIRCLE(199,I),
20,1,.4,.1,.38:NEXTI
750 DRAW"BM204,134NF10RNF10RNF10
RF10NR10UNR10UR10NH8RNH8RNH8RH8B
L6BU4NR8UNR8UNR8UR8NH5UNH5UNH5"
752 FORI=92TO94:CIRCLE(127,I),30
,1,.4,.6,.9:CIRCLE(164,I+8),26,1
,.8,.65,.85:CIRCLE(190,I+4),28,1
,.6,.67,.85
754 CIRCLE(190,I+14),30,1,.6,.7,
.9:CIRCLE(178,I+50),30,1,1.8,.75
,.9:CIRCLE(180,I+53),30,1,1.8,.7
5,.9:NEXTI
756 DRAW"BM204,118NR6DR6DL4R6DL4
R6BM204,84NE5RNE5RNE5RNE5BR4BD2N
E5RNE5RNE5RNE5BD2BL4F4R4E4DG4L4H
4DF4R4E4"
758 FORI=1TO3:CIRCLE(170,72+I),1
7,1,.6,.5,.99:CIRCLE(150,48+I),1
7,1,.6,.6,1.1:CIRCLE(177,58+I),1
7,1,.6,.7,.99:NEXT
760 PMODE3,1
762 FORY=0TO176STEP176:FORI=0TO1
0STEP10:LINE(10+I,Y+7-I/10)-(245
-I,Y+7+I/10),PRESET,BF:NEXTI,Y
764 FORI=84TO87:I$=STR$(I)
766 DRAW"BM"+I$+",146S5C1U4H3U3B
R6BDU3H2BD16BR10U4H2U4E4BR6BD6F2
D8BU12U4E3BU2BR4F4D2G2BD2BR4G4D2
BD4BR3ND4E7U4BR6NE3D3BR8ND6BR6E4
U2BR4BD6D4G2D4BL18BD4U6S4"
768 NEXTI
770 PMODE4,1:COLOR0,1
772 LINE(10,96)-(28,96),PSET:LIN
E(20,95)-(28,97),PSET,BF
774 LINE(245,96)-(225,96),PSET:L
INE(225,95)-(235,97),PSET,BF
776 LINE(68,18)-(185,0),PRESET,B
F
778 PMODE3,1
780 DRAW"BM74,12C1R6U4NL4U4NL6BR
6D8R6U4NL6U4NL6BR14NR6D4R6D4NL6B
R6U8R6D4L6D4BR12NR6U4NR6U4R6BR6N
R6D8R6BR6NU8BR6U8R6D4NL6D4BR6NU8
R6"
782 X$=INKEY$:IFX$=CHR$(13) THEN
 26 ELSE 782
784 '
786 '
798 ' AC-DC
800 PMODE4,1:PCLS1:SCREEN1,1
802 PMODE3,1
804 A$="L8D12F4G8H8E4U36E12F12D3
6F4G8H8E4U12BU8U10H8D18R8"
806 C$="H12U36E12F12G8H6D32E6F8G
12"
808 D$="H8E4U36H4E8R14F8D44G8L14
BU9BR4U42R5F4D34G4L5"
810 DRAW"C1S8BM42,90"+A$
812 DRAW"BM90,138"+C$
814 DRAW"BM150,138"+D$
816 DRAW"BM226,138"+C$
818 DRAW"BM136,50L10G6R4G6R4G6M1
22,70L3M130,60L3M136,50S4"
820 X$=INKEY$:IF X$=CHR$(13) THE
N 26 ELSE 820
```

# Creating Random Name Files

By Bob Albrecht & George Firedrake
*Rainbow* Contributing Editors

This time, we present a program you can use to make a file of random names, using any consonant-vowel structure you choose. When you run the program, first you see briefly:

```
NAMES TO TAPE
```

This is on-screen momentarily while the CoCo is opening a cassette file for output. Of course, you first position a cassette in the tape recorder and press the [PLAY] and [RECORD] buttons — before typing *RUN*. Next you see:

```
NAME STRUCTURE? ■
```

Type a C-V (consonant-vowel) structure and press [ENTER]. Here is what happened when we did it.

```
NAME STRUCTURE? CVCVC

GODAK



 TO SAVE NAME, PRESS "S"
 FOR ANOTHER NAME, PRESS SPACE
 FOR NEW STRUCTURE, PRESS "N"
 TO CLOSE FILE, PRESS "C"
```

Consonant-vowel-consonant-vowel-consonant

You now have four options. Do you want to save the name GODAK on tape? If so, press the "S" key. Want another name using the same C-V structure? Press the [SPACE BAR]. Want to try a new name structure such as CVCV or VCCVCV? Press the "N" key, then enter the new name structure. When you have all the names you want to save, press the "C" key and the CoCo will close the file.

*(Bob Albrecht and George Firedrake are two of the most prolific authors in the microcomputer world today. Specialists in writing for beginners, they are authors of numerous books, including **TRS-80 Color BASIC**.)*

1500 . . . . . . 241
END . . . . . . . . 4

**The listing:**

```
1000 REM**NAMES TO TAPE GMA 17-1
1010 CLS: PRINT "NAMES TO TAPE"
1020 OPEN "O", -1, "NAMES"
1100 REM**GET NAME STRUCTURE NS$
1110 CLS
1120 INPUT "NAME STRUCTURE"; NS$
1200 REM**MAKE $ PRINT NAME$
1210 GOSUB 1710
1220 PRINT @64, NAME$
1300 REM**REM**TELL OPTIONS
1310 PRINT @384, "TO SAVE NAME,
PRESS 'S'"
1320 PRINT "FOR ANOTHER NAME, PR
ESS SPACE"
1330 PRINT "FOR NEW STRUCTURE, P
RESS 'N'"
1340 PRINT "TO CLOSE FILE, PRESS
 'C'";
1400 REM*GET RESPONSE & DO IT
1410 KY$=INKEY$:IF KY$="" THEN 1
410
1420 IF KY$="S" THEN 1510
1430 IF KY$=" " THEN 1210
1440 IF KY$="N" THEN 1110
1450 IF KY$="C" THEN 1610 ELSE 1
310
1500 REM**PUT IN CASSETTE BUFFER
1510 PRINT #-1, NAME$
```

```
1520 PRINT @128, "SAVING " NAME$
1530 FOR KK=1 TO 2000: NEXT KK
1540 PRINT @128, CHR$(30)
1550 GOTO 1310
1600 REM**CLOSE THE FILE
1610 CLOSE -1
1620 CLS
1630 PRINT "THE FILE IS CLOSED"
1640 STOP
1700 REM**MAKE A NAME SUBR.
1710 NAME$ = ""
1720 FOR KK=1 TO LEN(NS$)
1730 : CV$ = MID$(NS$, KK, 1)
1740 : IF CV$="C" THEN GOSUB 181
0
1750 : IF CV$="V" THEN GOSUB 191
0
1760 NEXT KK
1770 RETURN
1800 REM**ADD A CONSONANT SUBR.
1810 C$="BCDFGHJKLMNPQRSTVWXYZ"
1820 RC = RND(21)
1830 RC$ = MID$(C$, RC, 1)
1840 NAME$ = NAME$ + RC$
1850 RETURN
1900 REM**ADD A VOWEL SUBR.
1910 V$="AEIOUY"
1920 RV = RND(6)
1930 RV$ = MID$(V$, RV, 1)
1940 NAME$ = NAME$ + RV$
1950 RETURN
1999 END
```

Here is a block-by-block description of the program.

**Block 1000** briefly prints NAMES TO TAPE on the screen and opens a cassette file for output. The file is called NAMES. If you are using Color BASIC, change line 1020 to:

1020 OPEN "O", #-1, "NAMES"

You may wish to rewrite block 1000 to include directions telling the user to position a cassette and press the [RECORD] and [PLAY] buttons on the tape recorder. See our SCAN CHARACTER FILE program in the March 1984 issue of *the Rainbow*.

**Block 1100** asks for the NAME STRUCTURE (consonant-vowel structure) and assigns it to the variable NS$.

**Block 1200** calls a subroutine to make one name and prints the name at screen position 64.

**Block 1300** prints the four options on the bottom four lines of the screen. Remember to include the semicolon at the end of line 1340. Without it, the screen will scroll.

**Block 1400** looks for a single key response (S, space, N or C). All other keys are ignored. If you press one of the four keys, the CoCo moves on to the appropriate block; if you press any other key (except [BREAK]), it simply repeats its request because of the *ELSE 1310* in line 1450.

**Block 1500** writes the value of NAME$ to the cassette buffer. It also puts a message on the screen at screen

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position 128 telling you it is saving the name. Line 1540 clears this message from the screen. CHR$(30) means "Clear to the end of this line." After saving the name, block 1500 sends the CoCo back to block 1300 to get another user response.

**Block 1600** closes the cassette file. If you are using Color BASIC, change line 1610 to: 1610 CLOSE #-1.

**Block 1700** is a subroutine to make a name and assign it as the value of NAME$. First, NAME$ is set equal to the empty string (""). Then, the *FOR . . . NEXT* loop scans the name structure (NS$) letter by letter, looking for the letters C or V. Each time it finds the letter C, it calls the ADD A CONSONANT subroutine. Whenever it finds the letter V, it calls the ADD A VOWEL subroutine. Letters other than C or V are ignored.

**Block 1800** is a subroutine to add a consonant to NAME$. Lines 1820 and 1830 select a random consonant from the string C$. Line 1840 appends the new consonant to the right end of NAME$.

**Block 1900** is a subroutine to add a vowel to NAME$. Lines 1920 and 1930 select a random vowel from the string V$. Line 1940 appends the new vowel to the right end of NAME$. Note that we include the letter Y as a vowel. Thus, names such as KOMYN or DYMAX are possible.

We leave to you the task of writing a program to read and display names from the cassette file of random names — well, "selected" random names — selected by you. You can do this in many ways.

- Read one name and display it. Press [SPACE BAR] to get another name.
- Read and display several names. Press [SPACE BAR] to get another bunch of names.
- Read only names having a specified name structure. For example, read only names with the structure CVCVC.

Since we have no reader response to our cassette file tutorials and programs, we assume you people out there are not much interested in cassette files. So, next time we will move on and begin a slow tutorial sequence on disk files.

### *TAIPAN: Your Own Contextual Computer Game*

In the early days of the TRS-80 Model I, we were privileged to play a simulation game called *Taipan*, written by Art Canfil. *Taipan* easily makes the top ten of all computer games we have played in the last 29 years.

So, a few months ago, we begged, implored, and downright coerced Art to write a book showing people how to write contextual computer games, using *Taipan* as the model. Art agreed and began writing the book, with the help of two high school students, Jim McClenahan *(DragonKong)* and Karl Albrecht *(DragonNewt)*. As Art puts it, "To the Dragon, who dragged us and dragooned us until we wrote this book. And to Elder Brother Wu, as a representative of financial realities. If the Dragon was the carrot, Wu was the stick . . ."

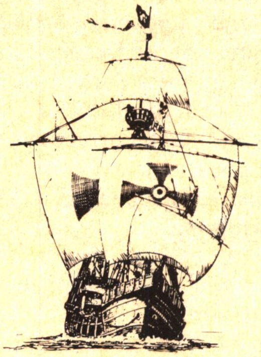
What is a contextual computer game? The authors say, "Home computers make possible a type of electronic game which is less based on exercising the reflexive speed of a person's brain stem than upon exercising the wonderful gray matter with which humans think. Some of the best of such games are those in which a complex environment is simulated by the program, and the player interacts in a 'lifelike' manner with that game environment. We call these complex environmental computer simulation games contextual computer games."

The first book will be our favorite computer, the CoCo. It will then be paraphrased for other computers: Commodore 64, IBM PC*jr*, possibly the Apple. *TAIPAN: Your Own Contextual Computer Game* is intended to give the CoCo user three things:

1) an understanding of some fundamental principles of game design;
2) an historical understanding of a particular game context (in this case, the turbulent China trade of the 1800s);
3) a step-by-step approach to actually writing a game in BASIC using points 1 and 2 above, including the actual program lines needed to provide a complete contextual computer game.

The authors hope that this book will provide the reader, not only with an enjoyable game providing many hours of entertainment, but that the reader will become interested in the game's historical background as well. And hopefully, the reader will be inspired to design original games based upon other historical or fantasy contexts.

Next time, Art Canfil will join "GameMaster's Apprentice" and we will include excerpts from his book-in-progress. May you live in interesting times.



### *FANTASY ROLE PLAYING GAMES*

*Millions of young people, and many not-so-young, are playing fantasy role playing games. A role playing game is a game in which one or more players create and control characters (adventurers) who live their imaginary lives in a specially made game world. The game world is created, managed, and operated by a GameMaster (GM), also called a referee, adventure master, or dungeon master (DM).*

*Most people who play role playing games use a formal rule system. Some of the best known are shown below.*

***Champions**. From Hero Games, 92A 21st Avenue, San Mateo, CA 94402.*

***Dungeons & Dragons (D&D)**. From TSR, P.O. Box 756, Lake Geneva, WI 53147.*

***RuneQuest (RQ)**. From Chaosium, P.O. Box 6302, Albany, CA 94706.*

***Tunnels & Trolls (T&T)**. From Blade, Box 1467, Scottsdale, AZ 85252.*

***Worlds of Wonder (WOW)**. From Chaosium, P.O. Box 6302, Albany, CA 94706.*

*Most programs in "GameMaster's Apprentice" are based on the game system used in **RuneQuest, Worlds of Wonder,** and **Adventurer's Handbook**. If you are a beginner, we suggest you try the following books.*

***Adventurer's Handbook: A Guide to Role Playing Games** by Bob Albrecht & Greg Stafford.*

***Through Dungeons Deep** by Robert Plamondon.*

*Both are available from Reston Publishing Company, 11480 Sunset Hills Road, Reston, VA 22090.*

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**TAKING BASIC TRAINING**

**16K**
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# This One's A Piece Of Cake

By Joseph Kolar
*Rainbow* Contributing Editor

The family that computes together, stays together. Let this be the thought for today.

Two months ago, my daughter joined the ranks of CoCo owners. To create her very first program, she used the theme of her husband's upcoming birthday. Curious to see how she was progressing and eager to see her creation, I suggested that she mail me a copy. I would critique it.

Copy *LISTING1* exactly. Look it over. Then, without elaborating or expanding it, correct any errors. Center it to give it a pleasing appearance. Alter and adjust the program to enhance it. This is your chance to show off your own progress in programming.

Do this before you read any further or before you key in *LISTING2*. See if you can find all the things that could stand a little modification.

Before keying in *LISTING2*, follow along with me and see one way to approach the problem. After making each change in *LISTING1*, you may *RUN* the program to see what you have done.

*CLOAD"LISTING1"* and *RUN*. The first thing that comes to mind is that the first panel needs to be pushed down for vertical centering. Since *PRINT@* was used in lines 2, 3, and 4, it does no good to add *:PRINT:PRINT* to line 1.

Without disturbing the contents of the three line heading, it was simpler to add +64 to the line locations in each of the three lines.

It looks neater if the space after WA in line 4 was changed to a period.

":PRINT" was added to line 5 to insert another blank row.

You may have made the change differently. You may have dropped the heading down another row; pushed up line 8 to center it tightly in the middle of the screen. The important thing is to make the display visually attractive.

A sentence or paragraph looks neater if it is indented. Two spaces were inserted after the first quote mark of line 6 to move the line to the right. Two spaces were deleted after the word "BY" to realign the sentence. If this step wasn't taken, a word would split and carry over to the next row.

A space was inserted after "PRESS" in line 8. The line of text was centered by inserting nine spaces after the first quote mark.

The next panel required a little work. The text is all bunched up in the upper-left corner. All that blank area is crying out to be utilized.

Either after *CLS* in line 9 or at the very beginning of line 10, add *PRINT:PRINT:PRINT:PRINT*. Use a beginning ":" if using line 9 or an ending ":" if inserting it in line 10.

It is not good practice to begin a line of text at the left margin. Allowing for a long name to be input, indent one space after the opening quote mark of line 10.

The *INPUT* statement will print a question mark. Thus, "?" at the end of the sentence is redundant. Delete it. Insert your first name and press [ENTER].

Indent line 20 about nine spaces by inserting them after the first quote mark. This line must be left of center to allow for the possibility of a long name. Since this is a surprise theme, add "!" at the end of line 20.

Indent line 30 one space as you did in line 10. Delete the redundant question mark at the end of the sentence. Enter your age and press [ENTER].

Looking over the resultant panel, we see that the text could be pushed down one more row for better vertical centering. Being lazy, rather than relocating each of the three lines, I decided to add a line of text. What suggested itself was "Well, I have news for you." This leads more smoothly into the following panel.

At this point, common sense would say *RENUM 40,31,10*, but to keep the same line numbers in both listings, common sense will not prevail. Don't renumber!

Instead, open up line 31. *DEL31* and insert "CLS" at the beginning of line 32. Insert a new line 31 — *31 PRINT: PRINT "WELL, I HAVE NEWS FOR YOU!"* Did you remember to leave blank space after the first quote mark? Three spaces were used so that the line would be horizontally centered.

---

*(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)*

Rather than jumping to the next panel, we will catch our breath and use a time wasting routine to give us time to read and digest the text. Add *:FOR Z = 1 TO 2000: NEXT* to the end of line 31.

The next panel looks very good. It must be oriented to left of center to allow for a possible long name.

Change the comma to a space in line 36. Add an exclamation mark at the end of the line so that it will appear after the name. I think a comma would be appropriate following HAPPY BIRTHDAY, but to save an extra space for a long name, leave it out.

The song flops right into the "cake" panel. Insert *40 FOR Z = 1 TO 1000:NEXT* for a less abrupt transition.

It bothered me that we called for an input in line 30, but failed to use it. What use could we have for the variable A that indicated the age? Determined to use that variable, it was envisioned to label the cake with the age neatly centered under the candle.

Studying the cake panel, the candle might look better if it were on top of the cake instead of being embedded in it. It also appeared to be a wee bit off-center.

A little trial and error was used to alter the cake and candle. Changing the 47 to 48 in line 50 made the cake wider. Changing 15 to 16 made it lower. The candle, line 70, was moved to the left and pulled out of the cake by changing (31 TO 34) to (30 TO 33).

Now, the age variable, A, could be moved under the candle, More trial and error work was involved until the correct *PRINT*@ location was found. Insert *60 PRINT*@ 302,A;.

The location 302 was a compromise. A one-digit age made it slightly off-center. A two-digit age was properly centered. You can't have everything. Working on the assumption the kids, nine and under, would not be critical, I opted for the two-digit location.

The cake is well-centered and nicely proportioned. The candle flame could use a little work. It could be lengthened to become more prominent.

To lengthen the flame, add *:SET(32,8,8)* to line 220. Add *:RESET(32,8)* to line 230. That isn't bad! To give it even more realism (as if a slight draft was causing the candle to flicker), add *:SET(31,9,8)* to line 220 and *:RESET(31,9)* to line 230.

Finally, inserting a time-wasting pause, *235 FOR Z = 1 TO 100:NEXT* slows down the flicker.

If you haven't done so, key in *LISTING2* and *RUN*. It is substantially a carbon copy of *LISTING1*. The integrity of the program wasn't altered; only the presentation.

The next time somebody in your family, or a friend, has a birthday, just *CLOAD"LISTING2"*, sit the birthday boy/girl at the keyboard and let him/her *RUN* it. I am sure they will get the message. Anyway, you have a little program, with the permission of newcomer, Betty Ann White, to add to your repertoire.

You may have gotten a few ideas of your own from following this half-baked debugging session. Work your will on *LISTING2* and alter it to your heart's content. Jazz up the cake. Put more pizzazz into the text. Add color. Modify or add sound. You are the boss!

If you come up with something interesting (I am sure you will), and are inclined to share it, send me a listing of your creation.

You saw one way to finalize a program. You did a little debugging. You saw the creative process in action. It is hoped that you got some ideas of your own as you systematically worked over *LISTING1*. It should have been a fun time. You need not be afraid to fool around with a program. Make sure you keep a backup copy of your listing so that, in case it gets zapped, you can start again.

What was the thought for today again? Oh, yes! The family that computes together stays together . . . and has more fun.

```
33 ......... 57
END ...... 130
```

**Listing 1:**

```
0 '<LISTING1>
1 CLS
2 PRINT @ 8, "BETTY ANN WHITE"
3 PRINT @42, "1303 3RD ST"
4 PRINT @ 70, "KIRKLAND, WA  980
33"
5 PRINT
6 PRINT "HAPPY BIRTHDAY WAS CREA
TED BY   BETTY ANN WHITE ON JANU
ARY 2,   1984 AND REVISED ON JAN
UARY 6."
7 PRINT
8 INPUT "PRESS<ENTER>"; E$
9 CLS
10 INPUT"WHAT IS YOUR NAME?";N$
15 PRINT
20 PRINT"HELLO,"N$
25 PRINT
30 INPUT "HOW OLD ARE YOU?";A
31 CLS
32 PRINT@ 131,"HAPPY BIRTHDAY TO
 YOU!
33 PLAY"O1;G;G;A;G;O2;C;O1;B"
34 PRINT@ 195, "HAPPY BIRTHDAY T
O YOU!"
35 PLAY "O1;G;G;A;G;O2;D;C"
36 PRINT@259,"HAPPY BIRTHDAY DEA
R," N$
37 PLAY "O1;G;G;O2;G;E;C;O2;B;A"


38 PRINT@323, "HAPPY BIRTHDAY TO
 YOU!"
39 PLAY "O2;F;F;E;C;D;C"
45 CLS(0)
50 FOR H=15 TO 47:FOR V=15 TO 23
:SET(H,V,7):NEXT V,H
70 FOR H=31 TO 34:FOR V= 10TO 15
:SET(H,V,2):NEXT V,H
120 FOR H=10 TO 53
130 SET(H,23,1)
140 NEXT H
217 PLAY"O2;F;F;E;C;D;C"
220 SET (32,7,8)
230 RESET(32,7)
240 GOTO 220
```

Listing 2:

```
35 ......... 114
END ...... 131
```

```
0 '<LISTING2>
1 CLS
2 PRINT @72, "BETTY ANN WHITE"
3 PRINT @106, "1303 3RD ST"
4 PRINT @134, "KIRKLAND, WA. 980
33"
5 PRINT:PRINT
6 PRINT "  HAPPY BIRTHDAY WAS CR
EATED BY BETTY ANN WHITE ON JANU
ARY 2,   1984 AND REVISED ON JAN
UARY 6."
7 PRINT
8 PRINT:INPUT "            PRESS <E
NTER>"; E$
9 CLS
10 PRINT:PRINT:PRINT:PRINT:INPUT
" WHAT IS YOUR NAME";N$
15 PRINT
20 PRINT"         HELLO "N$"!"
25 PRINT
30 INPUT " HOW OLD ARE YOU";A
31 PRINT:PRINT"    WELL, I HAVE N
EWS FOR YOU!":FOR Z=1 TO 2000:NE
XT
32 CLS:PRINT@ 131,"HAPPY BIRTHDA
Y TO YOU!
33 PLAY"O1;G;G;A;G;O2;C;O1;B"
34 PRINT@ 195, "HAPPY BIRTHDAY T
O YOU!"
35 PLAY "O1;G;G;A;G;O2;D;C"
36 PRINT@259,"HAPPY BIRTHDAY DEA
R " N$"!"
37 PLAY "O1;G;G;O2;G;E;C;O2;B;A"


38 PRINT@323, "HAPPY BIRTHDAY TO
 YOU!"
39 PLAY "O2;F;F;E;C;D;C"
40 FOR Z=1 TO 1000:NEXT
45 CLS(0)
50 FOR H=15 TO 48:FOR V=16 TO 23
:SET(H,V,7):NEXT V,H
60 PRINT@302,A;
70 FOR H=30 TO 33:FOR V= 10TO 15
:SET(H,V,2):NEXT V,H
120 FOR H=10 TO 53
130 SET(H,23,1)
140 NEXT H
217 PLAY"O2;F;F;E;C;D;C"
220 SET (32,7,8):SET(32,8,8):SET
(31,9,8)
230 RESET(32,7):RESET(32,8):RESE
T(31,9)
235 FOR Z=1 TO 100:NEXT
240 GOTO 220
```

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## WOMEN AND THE COCO

**16K**
**ECB**

*This is the second of a five part series*

# CoCo Widows

### By Susan P. Davis

A new term has cropped up: "CoCo Widow." We all know about football widows and golf widows. Now, it seems, countless women are sitting alone due to the amount of time their men are spending with the Color Computer. One *Rainbow* advertiser has very cleverly capitalized on this pathetic situation by offering "CoCo Widow" needlework.

My favorite anecdote comes from a member of the Columbus and Central Ohio Color Computer Users Group. This man was working relentlessly on a program. He designed it, wrote it and debugged endlessly. Finally, at 2 a.m., it worked. Eureka! He dashed upstairs to share the sweetness of this victory with his wife. He shook her awake and babbled excitedly and proudly. She opened one eye, gave him an icy stare, grumbled "Who cares?" and indignantly turned over and went back to sleep. He was crushed. When I spoke with her later about the incident, she told me that she bitterly resented the computer and that it takes her husband's time away from her and the children. When I asked her if her husband couldn't show her what the computer could do and how it could help her, she retorted, "Unless it can run the sweeper, there is no way it could help me at all."

Another fellow bought a Color Computer and set it up in his bedroom because that's where the television was. To do this, he shoved all of his wife's knickknacks off the double dresser and replaced them with the computer, tape recorder, a few cassettes and some note pads. After a while, the tape collection grew. It no longer fit on the dresser and it looked just awful. So, this guy emptied all of his wife's clothes out of one drawer and filled the drawer with tapes. He then stuffed her clothes into other drawers and almost succeeded in closing them. The next day, that couple bought a new television for the bedroom, allocated the old set for computer use and gave the husband his own space — the former sewing room!

No wonder there's resentment! Even from women who are gradually learning to use the CoCo for word processing or to help the kids in school. They told me that the difference is that football, baseball, golf, etc., all have a season that is eventually over. The Color Computer can be turned on any hour of the day or night — and frequently is.

Another reason for the resentment is that many women feel that they don't "understand" the computer. It makes them feel dumb and uncomfortable. A simple analogy might help here. Just as one does not need to understand how electricity works in order to flick on a light switch, one does not need to understand the Color Computer's circuitry in order to have a good time with it. Just view the CoCo as another household appliance, as a tool which makes a task easier to perform. That task could be producing mailing labels, finally organizing that record or stamp collection, printing off 10 originals of the same resume or keeping the children occupied. Really, all you have to understand is how to turn the computer (and other hardware devices) on and off, how to insert the appropriate tape or disk and how to load the software. This is not as complicated as pressing all the appropriate buttons on the latest model Lady Kenmore washing machine just to do a load of laundry.

Lots of the women I speak with seem to be turned off by "games." They use "games" as an excuse not to use the computer. They do recognize the educational value of the Color Computer, and we'll discuss this next month.

I have asked some women if they would consider using the CoCo to perform a small, practical task; balancing their checkbook, for example. Some told me that they prefer to balance the checkbook with a calculator. Another simple task is paying the monthly bills. Several of these women use their push button phones to use the pay-by-phone feature offered by their banks. They said they might be interested in having me show them how to use the Color Computer to pay

---

*(Susan Davis has a master's degree in linguistics and has taught Spanish on the high school and college levels. She is also a C.L.U. with seven years experience in the life and health insurance fields. In addition, she designs educational programs for Sugar Software, which she own with her husband, Gary.)*

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|---|---|---|
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|---|---|---|
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| | T & D INCLUDED | |
|---|---|---|
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| | T | D |
|---|---|---|
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| | T | D |
|---|---|---|
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|---|---|---|
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| | T | ROM PK |
|---|---|---|
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| | T | D |
|---|---|---|
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| | T | D |
|---|---|---|
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|---|---|---|
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their bills for them. So the program listing at the end of this article shows how you can use the Color Computer to help you bank at home.

We got the idea for this program from CompuServe. They had a similar program for use with another computer and modem.

Our *BANKER* program requires a 16K ECB Color Computer, Hayes SmartModem and a Huntington Bank Pay-By-Phone account. The program is easily modified for other modems and other banks with the pay-by-phone feature. It allows easy and convenient use of the Pay-By-Phone service. The computer transmits your account and code information using touch tones. A menu of accounts is displayed to allow you to choose who to pay, how much and the desired payment date. This is a very practical use of the Color Computer. I hope that some of your CoCo widows will give it a try.

Load and run *BANKER*. The SmartModem must be powered on. At the first prompt, enter your secret password. To practice, just hit [ENTER]. The primary menu will be displayed.

The up and down arrow keys are used to position the cursor block to the desired menu item. Generally, the cursor will be positioned for you following the execution of a menu item.

Hit [ENTER] when the cursor is on the menu item you want to select.

If the [CLEAR] key is hit, "*#" is sent to the bank's computer to cancel the previously completed message.

If the [?] key is hit, "#" is sent to have the bank's computer repeat the last message.

| | |
|---|---|
| 300 ......... | 5 |
| 530 ......... | 246 |
| 800 ......... | 27 |
| 1000 ...... | 108 |
| 1300 ...... | 191 |
| 1540 ...... | 176 |
| END ...... | 224 |

```
10 '      Banker
20 '
30 ' Bank-by-phone
40 '
50 ' (C) 1984 By Sugar Software
60 '    Written by Gary Davis
70 '       2153 Leah Lane
80 ' Reynoldsburg, Ohio   43068
90 '      (614) 861-0565
100 '
110 'Banker is set up for the
120 'Huntington Banks (Columbus)
130 'Pay-By-Phone system. It
140 'requires a Hayes Smartmodem
150 'but may be modified for
160 'other banks and other auto
170 'dial (tone) modems.
180 '
190 POKE150,180:' 300 BAUD
200 DV=-2:' TO MODEM
210 'Allow output to serial line
```

## RAINBOWfest Women's Seminar

At the RAINBOWfest in Long Beach, I had the privilege to participate in a panel discussion on Women and Computers. Linda Nielsen, a partner in Moreton Bay Software, chaired and organized the discussion. She brought together women with a variety of computer knowledge and expertise.

The panel members represented different phases and uses of the computer. I think that overall we had a very balanced panel. The members were as follows: Cindy Shackleford, *Rainbow's* West Coast advertising and marketing director; Caroline Webster, owner of Software Plus, a computer store in Citrus Heights, Calif.; Mary Nielsen, Linda Nielsen's daughter, with a teenager's viewpoint; Sherry Zuehlke, a local teacher and president of the South Bay Color Computer Club; Nancy Davis, a computer programmer; and myself, Sara Nolan, a partner in Prickly-Pear Software. I personally use the computer as a tool, but do not program very much.

The atmosphere was informal, and after a short synopsis by each panel member on how they came into the computer field, an open discussion was held with the audience.

Out of the discussion came some very important points. More women are interested in computers today but few belong to a club. A woman whose husband has a computer feels foolish asking about programming techniques from him. Also, women get little time to gain the same knowledge their spouse has, as he is always using the computer. It was strongly recommended that women get their own computers and learn for themselves that they can't break or hurt a computer by touching the wrong key.

There was a fraction who were definitely afraid of the computer. They thought they might break it by typing the wrong key, that you had to know math to use it, and they weren't sure they could learn to program. Computerization threatens them in their jobs, they said, because if they didn't learn about computers they would be left out. At home, their husbands or children are spending all their time with the computer.

It was pointed out that the great thing about computers is that you don't need to know anything about them to use them. They are a tool, like the microwave in the kitchen or the TV in the living room. As with any new tool, you need to learn a few things. You need to learn to turn them on and load a program.

Software companies around the country are producing quality, user-friendly programs for many applications. Probably the one most used by everyone is a good word processor. It can be used for letters or bulletins or writing articles or children's term papers . . . the list can go on forever.

My feeling from the imput of the panel and audience was that women can bring much to the computer revolution, but they will need to get involved and learn to use their computer just like any other tool.

**— Sara Nolan**

```
220 'without waiting for READY.
230 A=65314:POKE A+1,48:POKE A,2
49:POKE A+1,52:POKE A,0
240 '
250 RET$=CHR$(13):BKSP$=CHR$(8)
260 UP$=CHR$(94):DN$=CHR$(10)
270 '
280 DIM VENDORNUM$(15),SEL$(15)
290 '
300 'Commands to init modem
310 BUFFER$="S11=50E0M2TQ1"
320 GOSUB 1340 ' Init modem
330 PHONENUM$="TD 555-3291;"   '
Insert your bank's number here!
340 SEL=1
350 GOTO 530
360 '
370 SEL$(1)="DIAL BANK COMPUTER"
380 SEL$(2)="TRANSMIT ACCOUNT NU
MBER"
390 SEL$(3)="TRANSMIT SECURITY N
UMBER"
400 SEL$(4)="PAY BILLS"
410 SEL$(5)="REPEAT"
420 SEL$(6)="REQUEST OPERATOR AS
SISTANCE"
430 SEL$(7)="HANG UP PHONE"
440 SEL$(8)="SETUP FOR PRACTICE
SESSION"
450 IF PRACTICE=1 THEN SEL$(8)="
SETUP FOR REAL SESSION"
460 SEL$(9)="RETURN TO BASIC"
470 NUMSEL=9:GOSUB 1390   ' GET S
ELECTION
480 ON SEL GOTO 620,700,760,820,
1110,1170,1230,530,1290
490 GOTO 470
500 '
510 'Setup session
520 '
530 CLS:PRINT "ENTER SECURITY CO
DE, OR enter   FOR PRACTICE SESS
ION ";
540 PRINT "(      )";
550 BL=1:MAXDG=4:GOSUB 1600:BL=0
560 IF LEN(FLD$)>0 GOTO 580
570 PRACTICE=1:ACCT$="D111111111
#;":PIN$="D2222#;":GOTO 370
580 PRACTICE=0:ACCT$="D028932067
21#;":PIN$="D"+FLD$+"#;":GOTO 37
0
590 '
600 'Dial bank
610 '
620 PRINT @484,"DIALING BANK COM
PUTER";
630 BUFFER$=PHONENUM$
640 GOSUB 1340
650 FOR X=1 TO 2000:NEXT X
660 SEL=SEL+1:GOTO 470
670 '
680 'Send acct#
690 '
700 BUFFER$=ACCT$
710 GOSUB 1340
720 GOTO 660
730 '
740 'Send ID#
750 '
760 BUFFER$=PIN$
770 GOSUB 1340
780 GOTO 660
790 '
800 'Select
810 '
820 SEL$(1)="0900 TRNSFR SVNGS T
O CHKNG":VENDORNUM$(1)="0900"
830 SEL$(2)="1000 TRNSFR CHKNG T
O SVNGS":VENDERNUM$(2)="1000"
840 SEL$(3)="1033 TRNSFR TO CHKN
G RESERV":VENDERNUM$(3)="1033"
850 SEL$(4)="1600 VISA":VENDORNU
M$(4)="1600"
860 SEL$(5)="3000 OHIO BELL":VEN
DORNUM$(5)="3000"
870 SEL$(6)="3010 C&SOE (ELECTRI
C)":VENDERNUM$(6)="3010"
880 SEL$(7)="4000 PENNYS":VENDOR
NUM$(7)="4000"
```

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```
890 SEL$(8)="4100 SEARS":VENDORN
UM$(8)="4100"
900 SEL$(9)="4300 LAZARUS":VENDO
RNUM$(9)="4300"
910 SEL$(10)="     NO MORE BILLS
 TO PAY":VENDORNUM$(10)="02"
920 SEL=1
930 NUMSEL=10
940 GOSUB 1390
950 BUFFER$="D"+VENDORNUM$(SEL)+
"#;"
960 GOSUB 1340
970 IF VENDORNUM$(SEL)="02" THEN
 SEL=7:GOTO 370
980 PRINT @480,"ENTER AMT (EX: 5
0.00)";
990 PRINT "(       )";
1000 MAXDG=6:GOSUB 1600
1010 BUFFER$="D"+FLD$
1020 PRINT @480,"DATE TO PAY (EX
: 22=22ND)";
1030 PRINT "(   )";
1040 MAXDG=2:GOSUB 1600
1050 IF FLD$="" THEN BUFFER$=BUF
FER$+"#;" ELSE BUFFER$=BUFFER$+"
*"+FLD$+"#;"
1060 GOSUB 1340
1070 GOTO 930
1080 '
1090 'Repeat
1100 '
1110 BUFFER$="D#;"
1120 GOSUB 1340
1130 GOTO 470
1140 '
1150 'Rqst operator
1160 '
1170 BUFFER$="D0#;"
1180 GOSUB 1340
1190 GOTO 470
1200 '
1210 'Hang up
1220 '
1230 BUFFER$="H"
1240 GOSUB 1340
1250 SEL=9:GOTO470
1260 '
1270 'Return
1280 '
1290 CLS
1300 END
1310 '
1320 'Send buffer
1330 '
1340 BUFFER$="AT"+BUFFER$+RET$
1350 PRINT#DV,BUFFER$
1360 RETURN
1370 '
1380 'Menu display
1390 CLS
1400 PRINT "     PAY-BY-MICRO TE
RMINAL"
1410 PRINT "MAKE YOUR SELECTION
BY USING THEUP AND DOWN ARROW KE
YS AND THEN HIT THE enter KEY."
1420 PRINT STRING$(32,243);
1430 FOR X=1 TO NUMSEL
1440 PRINT "( ) ";SEL$(X)
1450 NEXT X
1460 IF SEL=0 THEN SEL=NUMSEL
1470 IF SEL>NUMSEL THEN SEL=1
1480 PRINT @(SEL-1)*32+1+5*32,CH
R$(182);
1490 C$=INKEY$:IF C$="" GOTO 149
0
1500 IF C$=CHR$(12) THEN BUFFER$
="D*#;":GOSUB 1340
1510 IF C$="?" THEN BUFFER$="D#;
":GOSUB 1340
1520 IF C$=RET$ AND SEL>0 THEN R
ETURN
1530 IF C$<>UP$ AND C$<>DN$ GOTO
 1490
1540 PRINT @(SEL-1)*32+1+5*32," 
";
1550 IF C$=UP$ THEN SEL=SEL-1 EL
SE SEL=SEL+1
1560 GOTO 1460
1570 '
1580 'Enter field
1590 '
1600 FLD$="":DG=1
1610 A=PEEK(&H88)*256+PEEK(&H89)
-&H400
1620 A=A-2-MAXDG
1630 PRINT@A,;
1640 PRINTCHR$(175);:D$=INKEY$:P
RINTBKSP$;:IF D$="" GOTO 1640
1650 IF D$=BKSP$ AND DG>1 THEN D
G=DG-1:FLD$=LEFT$(FLD$,DG):PRINT
 D$;:GOTO 1640
1660 IF DG>MAXDG AND D$<>RET$ GO
TO 1640
1670 IF D$=RET$ THEN RETURN
1680 IF D$="." OR D$="*" GOTO 17
10
1690 IF D$<"0" OR D$>"9" GOTO 16
40
1700 IF BL=1 THEN PRINTCHR$(214)
;:GOTO1720
1710 PRINT D$;
1720 IF D$="." THEN D$="*"
1730 FLD$=FLD$+D$:DG=DG+1
1740 GOTO 1640
```

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# Looking At LOGO From BASIC

By Don Inman
*Rainbow* Contributing Editor

You may have noticed that the title of this department has changed from Using Graphics to CoCo Graphics. All previous articles in the series have been concerned with creating graphics through Extended Color BASIC. In the next few issues, I will be presenting some material on Color LOGO, a language that may be new to you. Due to the change in content, I felt a change of title would be appropriate.

Dale Peterson's friend, Uncle Bert, has been greeting you for several past issues of *the Rainbow* with his discoveries of Color LOGO. Many of you may have attended one of the LOGO seminars at the Fort Worth or Long Beach RAINBOWfests. Whatever your degree of interest in LOGO may be, I hope you enjoy this series containing a look at Color LOGO through the eyes of BASIC.

There are many differences between creating graphics through Color LOGO and through BASIC. There are also many similarities. Color LOGO programs are made up of one or more blocks (or modules) called procedures. The first examples will consist of only one procedure. LOGO programs can be made very readable through indentation and grouping of lines into logical functions. There is no need for line numbers as the lines are executed in the order of appearance. Hence, the dreaded, much-abused, and often confusing *GOTO* statement is unneeded and non-existent in the language.

Graphics in BASIC are created by drawing between specific X, Y coordinates on the screen. Color LOGO differs in this respect by creating graphics by movements that are relative with respect to the current position and heading of the image of a "turtle" on the screen. The turtle is moved by the commands FORWARD and BACK. Its heading is changed by turning to the RIGHT of LEFT. The following examples demonstrate and explain some of the differences between Color LOGO and BASIC.

Suppose you wish to draw an equilateral triangle (all sides equal) at the center of the screen. Equilateral triangles have interior angles of 60 degrees.

---

*(Don Inman is the acknowledged master of microcomputer graphics and the author of a large number of books. He has been working with Color* LOGO *since it was introduced. With this issue, his column now becomes a blend of graphics produced by both Color* LOGO *and Extended Color* BASIC.*)*

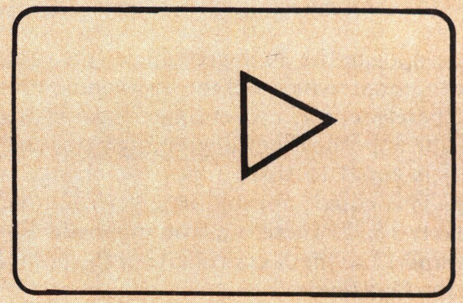

**Figure 1**
**Equilateral Triangle**
**(all sides equal; all angles = 60 degrees)**

Let's look at BASIC first. Suppose we wish the sides of the triangles to be 20 units in length. The center of the screen, for both languages, has an X coordinate of 128 and a Y coordinate of 96. Since BASIC's *DRAW* command is limited to drawing lines at multiples of 45 degrees, we must turn to the *LINE* command and draw from one end-point of a line to a second end-point. The vertical line is easily calculated by subtracting 20 from the original Y coordinate. This gives:

```
LINE(128,96)-(128,76),PSET
```

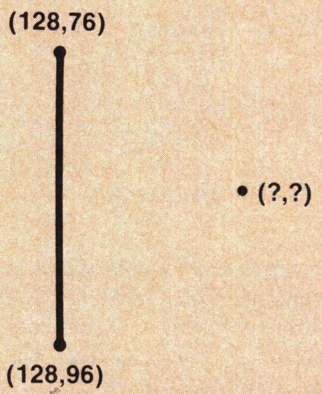

**Figure 2**
**First Line**

The second line is harder. Some geometry or trigonometry must be used. If you look at Figure 3, you can see that a 30-60 degree right triangle can be formed to aid the calculations.

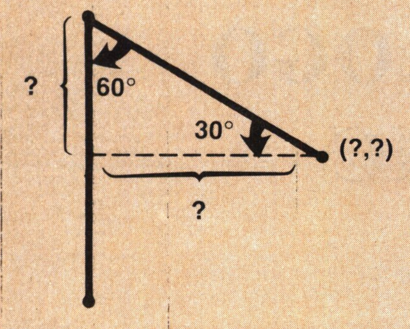

**Figure 3**
**First and Second Lines**

The side opposite the 30 degree angle (the change in Y coordinate) is equal to one-half the hypotenuse (one-half of 20 = 10). Therefore, the Y coordinate must change by 10 units. The side opposite the 60 degree angle (the change in X coordinate) is equal to three times the change in the Y coordinate. This equals approximately 1.732 times 10, or approximately 17.32. Therefore, you must add 10 to the Y coordinate and 17 to the X coordinate of the point forming the end of the first line:

56 + 10 for Y and 128 + 17 for X

The BASIC statement is:

```
LINE -(145,86),PSET
```

The final line goes back to the original point (128,96) by the BASIC statement:

```
LINE -(128,96),PSET
```

You can see that drawing the triangle with BASIC is quite a mathematical chore because the end points of the lines must be specifically defined. Color LOGO avoids this point-to-point construction by using its relative commands FORWARD 20 and RIGHT 120, repeated three times. These commands can be abbreviated FD 20 and RT 120. Let's now take a look at comparable programs in Color LOGO and BASIC.

**Color LOGO**

```
TO TRIANGLE
 COLORSET 1
 CLEAR
 REPEAT 3(FD 20 RT 120)
END
```

**BASIC**

```
10 PMODE 3
20 PCLS
30 SCREEN 1,1
40 LINE(128,96)-(128,76),PSET
50 LINE -(145,86),PSET
60 LINE -(128,96),PSET
70 GOTO 70
80 END
```

The LOGO procedure must have a name (ours is TRIANGLE). The LOGO statements COLORSET 1 and CLEAR perform similar functions to the BASIC statements *PMODE 3*; *PCLS*; and *SCREEN 1,1*. The REPEAT statement of Color LOGO performs a similar function as a *FOR . . . NEXT* loop in BASIC. All statements in parentheses following REPEAT 3 are performed, in order, three times. This line performs the same function as lines 40, 50 and 60 in the BASIC program. There is no need to calculate where the end points of the sides lie in Color LOGO since the lines are drawn by relative movements shown in Figure 4.

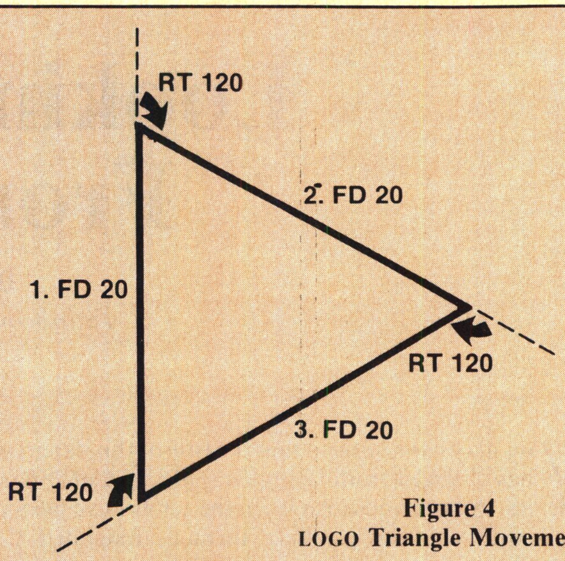

**Figure 4**
**LOGO Triangle Movements**

Now let's move on to a regular polygon with more sides. Take a regular pentagon (five equal sides). Once again, BASIC requires some detailed calculations. Since there are five sides, the exterior angles of the pentagon are found by dividing 360 by five. This equals 72 degrees. The interior angles of the regular pentagon are 180-72 or 108 degrees.

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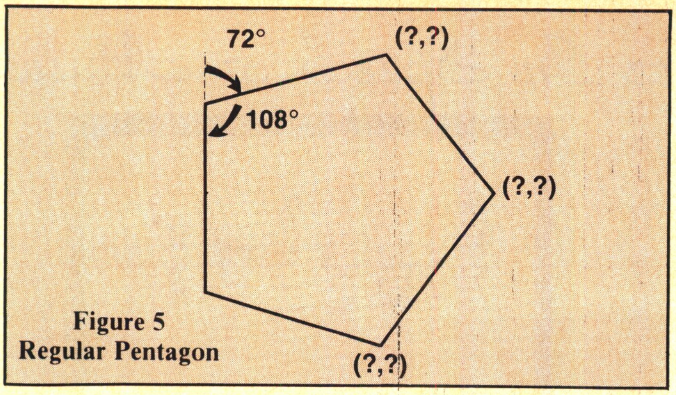

**Figure 5**
**Regular Pentagon**

I won't go into the calculations necessary to find the end points of the sides for the BASIC program. I'll leave that to you. You can use some of the trigonometry shown in earlier Using Graphics articles. However, let's take a look at the comparison of Color LOGO and BASIC programs.

**Color LOGO**

```
TO PENTAGON
 COLORSET 1
 CLEAR
 REPEAT 5(FD 20 RT 72)
END
```

**BASIC**

```
10 PMODE 3
20 PCLS
30 SCREEN 1,1
40 LINE(128,96)-(128,76),PSET
50 LINE -(?,?),PSET
60 LINE -(?,?),PSET
70 LINE -(?,?),PSET
80 LINE -(128,96),PSET
90 GOTO 90
100 END
```

Notice that the Color LOGO program for PENTAGON is the same size as the TRIANGLE program, but the BASIC program has grown.

Now suppose that you want to draw a regular polygon with 12 sides. Take a look at this:

**Color LOGO**

```
TO TWELVE
 COLORSET 1
 CLEAR
 REPEAT 12(FD 20 RT 30)
END
```

**BASIC**

I leave the BASIC program to you. Remember, there are twelve sides — lots of points.

Notice that the change in the Color LOGO procedures merely reflect a change in the number of sides:

```
REPEAT N(FD 20 RT M)
```

↑ **N = number of sides** ↑ **M = 360 number of sides**

This means that you can very easily write one general procedure that will draw a regular polygon of any desired number of sides. This will be demonstrated in the next issue.

Many people call Color LOGO a children's programming language. I would rather think of it in other ways. It could be considered a non-mathematician's programming language as you have seen from the examples in this article. It could also be thought of as a beginner's language since it is so straightforward and easy to use. I like to think of it as a fun-language because I have fun whenever I use it.

* Color LOGO is available at your Radio Shack stores in either cartridge or diskette formats.

* Also available:
*Color LOGO Guide For Parents* by Zamora and Albrecht
*Color LOGO Guide For Teachers* by Inman and Albrecht

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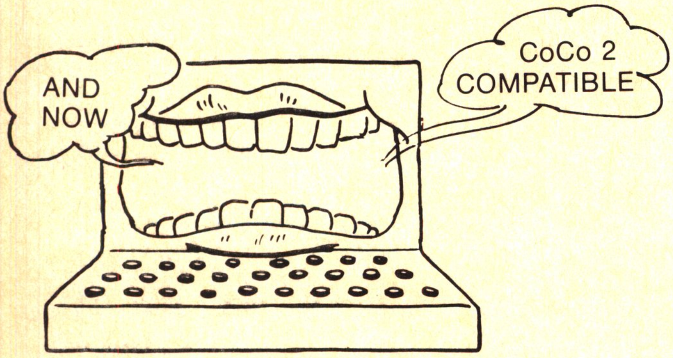

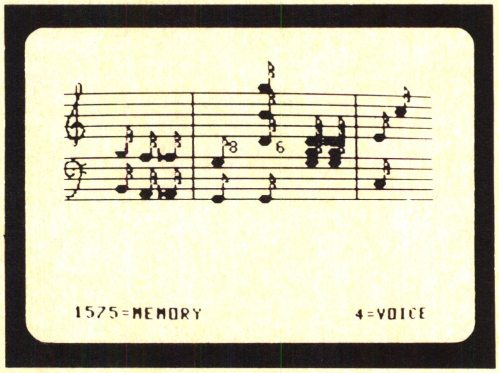

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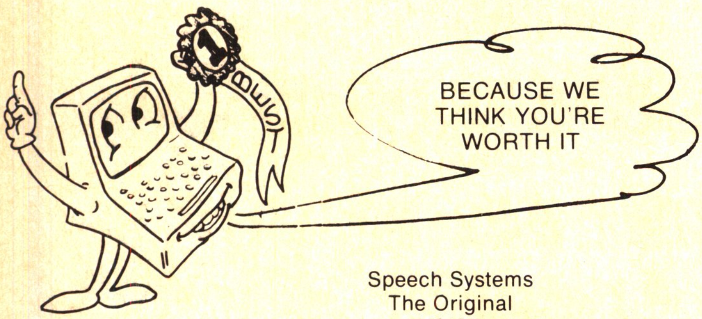
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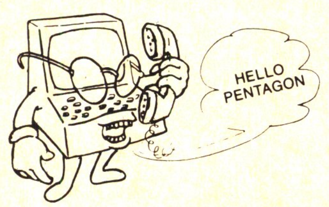

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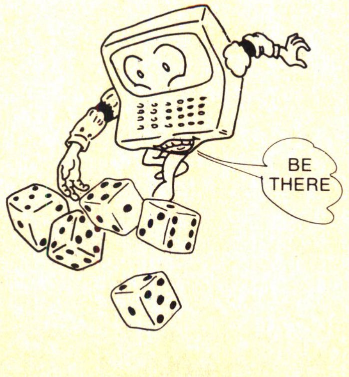

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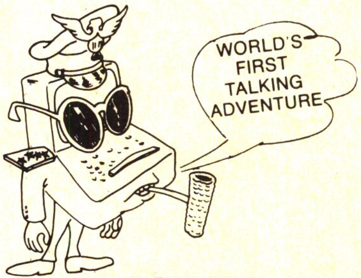

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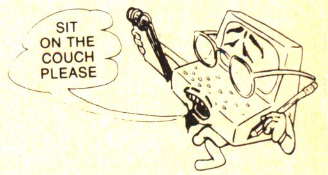
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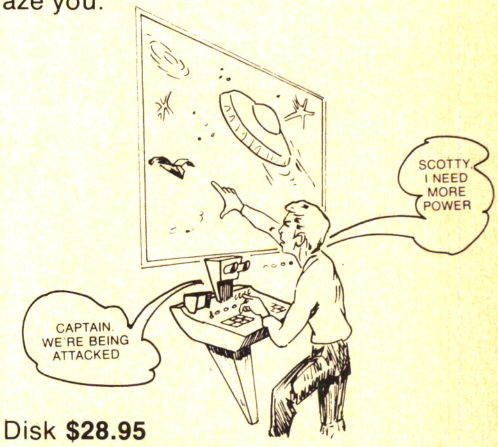

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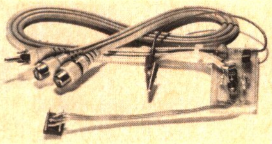

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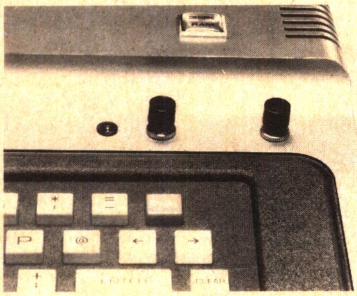

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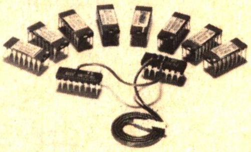

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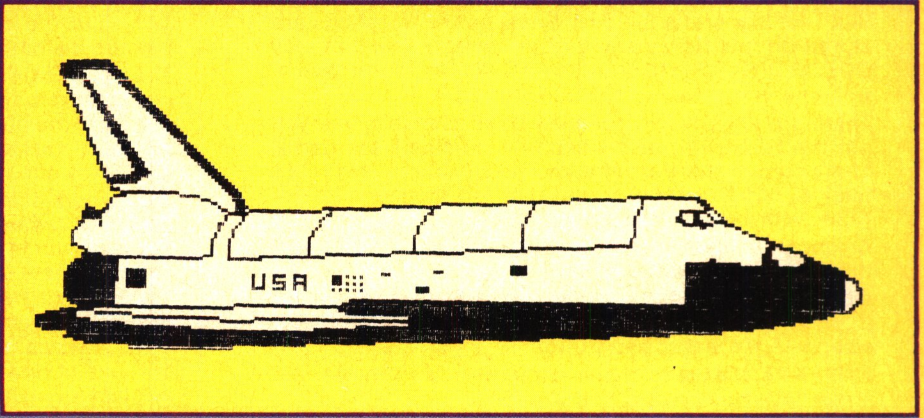
# Shuttle Graphic

## By Jeff Kawa

*A realistic illustration of the space shuttle Columbia*



For all you amateur astronauts, here is the picture you have been waiting for. Picture the space shuttle Columbia after blasting off the launch pad and rising to the highest extent. This computer picture will add excitement and drama to your space dreams. Before your very eyes you will be able to see the space shuttle unfold. The detailed illustrations are authentic and realistic.

Lines 5 through 20 use the highest graphics mode available. Clearing the screen in a buff color, the space shuttle will unfold in the following lines:

Line 25 draws the nose and front of the space shuttle.
Line 30 draws the top of the shuttle.
Lines 35 through 70 draw the tail using a *FOR . . . NEXT* loop (Example: *FOR n=1 to 10:NEXT n*)
Lines 75 and 80 draw the rudder.
Line 85 draws the orbital maneuvering engines and fuel tanks.
Lines 90 and 95 draw one of the main engines, the wing, and the underbody of the shuttle.
Lines 100 through 115 draw the shuttle's cargo bay doors.
Lines 120 through 155 draw and paint the heat resistant tiles.

*(Jeff Kawa, a 13-year-old eighth grade student, works with computers primarily as a hobby. He has taken summer computer courses where he studied* BASIC *programming and is presently in a computer science class. His career plans include becoming a computer engineer.*

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### Color Disk Trivia

is simply a very good, and very fun to play game. It has everything going for it: The challenge of trivia, ease of use, a good social game encouraging conversation, and you may even learn something! The development system (included) even lets you easily create your own custom question disks.

The play of the game is easy to understand, because the computer does all the work for you. It even looks up and presents the proper question!

On each question disk there are five categories, and there are an amazing 1100 questions on each disk. No, that's not a misprint, we said 1100 questions per question disk! Yes, that is a pretty full disk. Because the questions are stored on the disk, instead of in memory, you can play **COLOR DISK TRIVIA** on any size Color Computer system with one disk drive — 16K, 32K, or 64K.

There are already five question disks available, and you get the GENERAL disk when you purchase the game. That's correct, there are already FIVE question disks with a total of 5500 questions available for shipment RIGHT NOW, with more on the way shortly.

All question disks have five categories and 1100 questions. The disks available now are:

**GENERAL:** (Included with the game) The categories for this disk are history, the written word, movies & television, science & the world, and sports.

**ENTERTAINMENT:** These categories are movies, the stage, television, music, and literature.

**BIBLE:** 1100 questions in five categories on the Old and New Testaments.

**SPORTS:** This disk will challenge even the very knowledgeable sports fan. All major sports (and some minor ones) are represented.

**CHILDREN:** No, this isn't questions ABOUT children, it's questions FOR children. 1100 fun questions just for the younger set.

The game of **COLOR DISK TRIVIA** can be played by from 1 to 4 people (or teams), and you set the length of the game at the start when you decide how many questions must be answered in each category to win. The computer chooses the categories randomly, though sometimes it will let you choose the category for yourself (or let your opponents choose for you). Because of this category selection by the computer, a single category can often hold you up while one of your opponents slips by to win. The outcome is always in doubt, and no player is ever eliminated.

Trivia lovers will enjoy the fact that you can play without other people if you desire, because the computer will provide plenty of challenge. We want to emphasize that this is, first and foremost, a fun game.

---

Your Personal check is welcome - no delay. Include $1.50 shipping for each program ordered. (Shipping free on $50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

### The Development System

Naturally, in order for our programmers to type in thousands of questions easily and accurately, a good development program to create the question disks had to be written, and we include this program with the game at no additional charge!

The program is all menu-driven and very user-friendly. That means that no knowledge of programming is needed to use it. If you can turn on your computer and type, you're all set! Now sit back and imagine the educational possibilities.

Yes, our question disks have 1100 questions, but the game program will handle question disks having any number of questions from 5 up to a full disk of 1100, so a teacher can type in 50 or 100 questions and answers (the questions are multiple choice), and then the students can play the "game" and have a great time, while accidently picking up the lesson. Let the natural spirit of competition fuel the learning process.

The development program is very easy to use, and gives you options to add questions, change or delete a question, and print the questions and answers on the screen (or a printer, if you have one). You can develop a question disk and easily add questions to it any time you wish.

This program finally gives parents and teachers the opportunity to easily create a custom learning program for any level student, and if we keep it a secret, no-one need know it's more than a game.

**TECHNICAL INFORMATION: COLOR DISK TRIVIA** is a mixture of Machine Language and BASIC. It uses Fielded Direct Access Disk Files. **COLOR DISK TRIVIA** requires 16K and at least one disk drive.

**ORDERING INFORMATION:**

**COLOR DISK TRIVIA GAME** with **QUESTION DEVELOPMENT SYSTEM** and **GENERAL** question disk containing 1100 QUESTIONS: **$29.95**

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Line 160 draws the USA insignia.
Lines 165 through 185 draw the American flag.

```
70 ......... 63
110 ....... 220
END ....... 25
```

**The listing:**

```
1 REM /SPACE SHUTTLE/
5 PMODE 4,1
10 PCLS 5
15 SCREEN 1,1
20 COLOR 0,5
25 DRAW"BM244,125;U3L1U2L1U1L3R1
U1L1U1L2U1L2U1L3U1L2U1L2D2L1D1L7
U2L2U4R1U1R2D1R3D1R3D1R1D1U1L1U1
L3U1L3U1L3R1U1L2U1L3U1C5L1C0L1U1
C5L1C0L1U1C5L1C0L1U1C5L1C0L2U2C5
L1C0U1C5L1C0U1C5L1C0U1C5L1C0;
30 DRAW"L2D1L7D2L1D1R2D1R5D1R1U1
L3U3R1D2R1D1R3U1C5R1C0R2L2U1C5L1
C0U1C5L1C0U1C5L1C0U2R1L2U1R1L2U1
L20D1C5L1C0L15D1C5L1C0L17D1C5L1C
0L18D1C5L1C0L16D1C5L1C0L16D1C5L1
C0L20U1C5L1C0L2D2R2L5R2U4R1D4R1U
4L3U1R2U1;
35 A$="L3U1L1R3L1U1"
40 FOR A = 1 TO 7
45 DRAW A$+";"
50 NEXT A
55 DRAW"L2U1R1L2U1R1L2U1L1R3L1U1
;
60 FOR A = 1 TO 10
65 DRAW A$+";"
70 NEXT A
75 DRAW"BM29,58;L1U1L12D1L2R13D1
L13D1R6D1R1L7R1D1R6D2R1D1R1D2R1D
2R1D2R1D1R1D2R1D2R1D2R1D1R1D2R1D
2R1D1R1D2R1D2R1D2L1D1L5D1L2U1L1U
2L1U2L1U3L1U2L1U2L1U3L1U2L1U3L1U
2L1U2L1U2L1U2L1U2R6D1R1;
80 DRAW"D1R1D2R1D1R1D2R1D1R1D2R1
D1R1D2R1D1R1D1L1R1D1R1D5U4R1D5U3
R1D2R1D2U1R1D3U1R1D1R1D2R1D1R1L1
D1L2D1L1D1U2R1U3D2R1D1L2D2L8U1R7
D1L6D2R3C5D1C0R17C5D1C0R6C5D1C0R
3C5D1C0R2C5D1C0R1C5D1C0R2C5D1C0D
1C5L1C0;
85 DRAW"D2C5L1C0L1D3C5L1C0D2C5L1
C0D5L3C5D1C0L29U1L5R1U2C5L1C0L2C
5U1C0L1U5C5R1C0R1C5U1C0U1R1U3R1U
2D1R2D1R2D4U2L5U1R5U1L5R2U1R1D1R
3U1R1U2C5R1C0U2C5R1C0R3U1"
90 DRAW"BM20,131;R10U8R1U6L5U1L5
D1L2D1L1D1L1D2L1D7R1D1R1D1R2D2L5
D1L4D1L3D1L2D1L2R2D1R4D1R7D2L1R3
D1R3D1R13D1R29U1R21U1R20U1R25U1R
22U1R20U1R17U1R15U1R9U1R6U1R6U1R
5U1R4U1R2U1R3U12D12R2U1R1U1R1U1R
1U1"
95 DRAW"BM218,110;L1D2L1D4L7U1L7
U1L1D1L7D13L97C5D1C0L2C5D1C0L30R
30D1R2D1R18D2L45C5D1C0L10C5U1C0L
25C5U1C0L11C5U1C0L4U1R44L44D1L1D
3R4D1R10D1R19D1R36U1R12U1R15U4"
100 DRAW"BM181,96;D3C5L1C0D2C5L1
C0D7C5L1C0D2L11C5D1C0L19C5D1C0L1
7R16U9C5R1C0U2C5R1C0U2C5R1C0U1"
105 DRAW"BM130,113;L20R6U6C5R1C0
U3C5R1C0U1C5R1C0U2C5R1C0R1U1"
110 DRAW"BM109,114;L19C5D1C0L18R
14U7C5R1C0U2C5R1C0U1C5R1C0U2C5R1
C0U1C5R1C0R1U1"
115 DRAW"BM72,116;L9U7C5R1C0U3C5
R1C0U1C5R1C0U1C5R1C0U1"
120 DRAW"BM144,117;D2R4U1L4U1R4"
125 DRAW"BM122,119;R2"
130 DRAW"BM120,124;D1L3U1R3"
135 DRAW"BM107,120R2"
140 DRAW"BM34,120;R5D5L5U5R5"
145 PAINT(210,125),0,0
150 PAINT(36,122),0,0
155 PAINT(24,121),0,0
160 DRAW"BM70,121;D4R3U4R1C5R2C0
R3L3D2R3D2L3R4C5R2C0U4R3D4U2L3"
165 PMODE 3,1:COLOR 7,8:LINE(96,
121)-(100,121),PSET
170 LINE(93,123)-(100,123),PSET
175 LINE(93,125)-(100,125),PSET
180 PMODE 4,1
185 COLOR 0,5:DRAW"BM93,121;D2R2
U2L2D1R2"
190 GOTO 190
```

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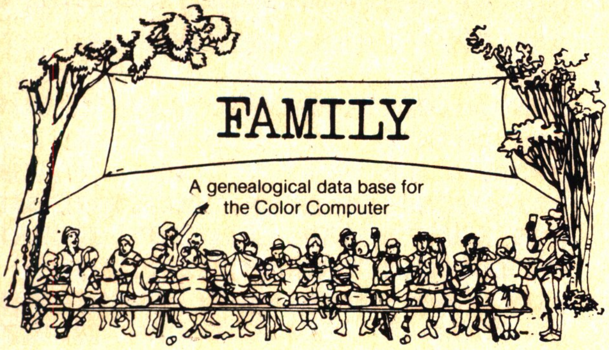
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*Color labels from your CGP-115*

# Special Delivery

**By Thomas Szlucha**

Do you want to really impress someone receiving mail correspondence from you? Try using a custom label drawn in colors with the CGP-115 printer/plotter. *CGPLABEL* is a program designed to draw such a label allowing the selection of one color for the text and another for a neat border drawn around the address. Figure 1 shows an example of such a label addressed to our favorite Color Computer magazine.

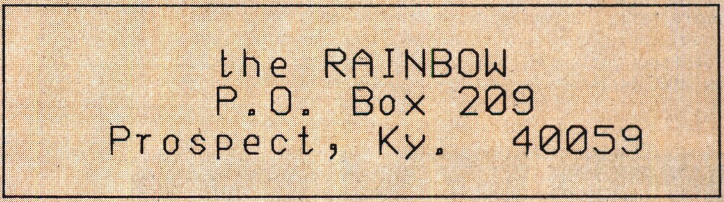
In developing this simple program I discovered a couple of interesting things about the CGP-115 printer that are worth passing on to other users. In the instruction manual, the "S" command used to set the text scale in the graphics mode allows values of zero through 63 to produce character sizes between 80 and one characters per line (cpl). This could obviously be interpreted as providing 64 unique character sizes. Unfortunately, this is not true. There are only 16 different character sizes because the formula to calculate cpl, shown below, is rounded off by the computer to the next lowest whole number.

cpl = 80/1+S where S is the scale parameter

Table 1 shows the relationship between values of S and the resulting characters per line.

**TABLE 1**

| S | cpl | S | cpl |
|---|---|---|---|
| 0 | 80 | 8-9 | 8 |
| 1 | 40 | 10 | 7 |
| 2 | 26 | 11-12 | 6 |
| 3 | 20 | 13-15 | 5 |
| 4 | 16 | 16-19 | 4 |
| 5 | 13 | 20-25 | 3 |
| 6 | 11 | 26-39 | 2 |
| 7 | 10 | 40-63 | 1 |



```
the RAINBOW
P.O. Box 209
Prospect, Ky.  40059
```

The other interesting discovery worth noting is that, although the documentation states that text mode character sizes are limited to 40 and 80 cpl, there is a technique that allows any of the graphics mode character sizes to be available in the normal text mode. When the printer is turned on, it cycles up in the text mode with the character size determined by the positon of dip switch 2 on the back panel. To change the character size, simply enter the graphics mode, *PRINT#-2,CHR$(18)* and [ENTER] the scale desired, *PRINT#-2,"Sx"*. Then switch back to the text mode, *PRINT#-2, CHR$(17)*. The printer will stay at that character size until switched off or a new size is selected.

*CGPLABEL* is designed to work with the MC-10, as well as the 4K Color Computer. It produces labels that are center-justified, using the largest character size that will fit the width of the paper. The label will fit in the sending address area of a business envelope and is large enough for packages. Being written for MC-10 and Color BASIC, commas are not allowed in the address. If you have Extended Color BASIC, change lines 20, 30 and 40 from *INPUT* to *LINEINPUT* to accept this punctuation. If you would like the address left instead of center-justified, change variables L1, L2, and L3 in lines 190, 210 and 230 to LM.

Unfortunately, real label stock is not available for the CGP-115. I find a glue stick handy for attaching the finished labels. The program provides dashed lines above and below the label to aid in trimming.

---

*(Thomas Szlucha, a frequent contributor to* the Rainbow, *enjoys free-lance writing. Home computing is a hobby enjoyed by his whole family.)*

```
190.......158
END.......55
```

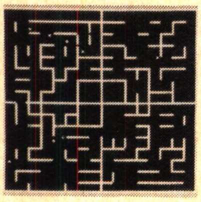
The listing:

```
1 'CGP-115 LABEL PRINTER
2 'BY T.SZLUCHA
3 'TO LEFT JUSTIFY CHANGE L1,L2
AND L3 IN LINES 190,210 AND 230
TO LM
4 '
5 '
10 CLS:PRINT"GGP-115 LABEL PRINT
ER
15 PRINT"CHECK YOUR PLOTTER PENS
!":FOR T=1 TO1500:NEXT:CLS
20 INPUT"NAME ";N$:L1=LEN(N$)
30 INPUT"STR ADDRESS ";SA$:L2=LE
N(SA$)
40 INPUT "CITY & STATE ";CS$:L3=
LEN(CS$)
50 CLS:PRINTN$:PRINTSA$:PRINTCS$
:PRINT
60 INPUT "CORRECT <Y>/<N>";R$:IF
 R$="Y" THEN 80
70 IF R$="N" THEN CLS:GOTO 20
75 GOTO 60
80 IF L1>=L2 THEN LM=L1 :GOTO90
85 LM=L2
90 IF LM<L3 THEN LM=L3
100 CC$="0=BLACK 1=BLUE 2=GREEN
3=RED"
110 CLS:PRINT"COLOR OF LETTERS":
PRINTCC$:INPUT C1:IF C1<0 OR C1>
3 THEN 110
120 CLS:PRINT"COLOR OF BORDER":P
RINTCC$:INPUT C2:IF C2<0 OR C2>3
 THEN 120
130 PRINT#-2,CHR$(18)
140 PRINT#-2,"C"C1
150 PRINT#-2,"M 0,-100"
160 PRINT#-2,"I"
170 S=INT(80/(LM+4))-1
180 CL=INT(80/(S+1))
190 B=INT(CL-L1)/2:GOSUB 500
200 T1$=BL$+N$
210 B=INT(CL-L2)/2:GOSUB 500
220 T2$=BL$+SA$
230 B=INT(CL-L3)/2:GOSUB 500
240 T3$=BL$+CS$
250 PRINT#-2,"S";S
260 PRINT#-2,"P";T1$
270 PRINT#-2,"M"0","480/CL*7/5*(
-1)
280 PRINT#-2,"P";T2$
290 PRINT#-2,"M"0","480/CL*7/5*(
-2)
300 PRINT#-2,"P";T3$
310 PRINT#-2,"H"
320 PRINT#-2,"C"C2
330 PRINT#-2,"L0"
340 YI=480/CL*7/5
350 X=0:Y=YI*2:GOSUB480
360 X=480 :GOSUB 480
370 X=480 :Y=(-3)*YI:GOSUB 480
380 X=0:GOSUB 480
390 X=0 :Y=(2)*YI:GOSUB 480
400 PRINT#-2,"L7"
410 PRINT#-2,"R"0","YI*1.5
420 PRINT#-2,"J480,0"
430 PRINT#-2,"R"0","YI*(-8)
440 PRINT#-2,"J -480,0"
450 PRINT#-2,"A"
460 CLS:INPUT"ANOTHER OF SAME LA
BEL <Y>/<N>";R$:IF R$="Y" THEN C
LS:GOTO130
470 INPUT"A DIFFERENT LABEL <Y>/
<N>";R$:IF R$="Y" THEN 10
475 CLS:END
480 PRINT#-2,"D"X","Y
490 RETURN
500 BL$=""
510 FOR I=0 TO B
520 BL$=BL$+" "
530 NEXT I
540 RETURN
```

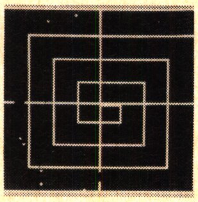
AT WITS END

(C) 1984 by Derringer Software, Inc.

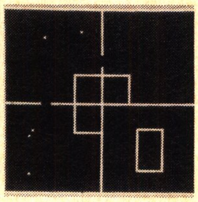
You may lose your sanity while playing this new game from Derringer Software! As the resident caretaker at the local "Home for burned-out programmers", your job is to keep the public safe by keeping the patients within the confines of the central compound. But, every now and then the somewhat erratic patients start running about and you find yourself having to open and close doors to get them to safety. Of course as one gets in, another may jump out! Three separate display screens with nine levels of play for each. Play against the clock for the best time. Score kept for each game and level.



CRAZY MAZE



SPIRALMANIA



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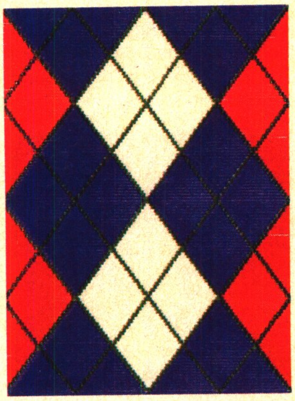


# Pretty As A Picture With CGP-115

By Thomas Szlucha

I would like to share this program with the many CoCo artists who like to have a permanent copy of their work. The program entitled *GPDUMP* is designed to take a picture drawn on the screen and reproduce it with the CGP-115 printer/plotter. If you have not seen one of these printers — or have ignored it thinking because of its small size that it must be a toy — it is really worth examining. Although it is small, it packs a lot of capability in a miniature scale, but this is not meant to be a Radio Shack advertisement, so on with the discussion of a very practical application for this printer.

The concept employed to create a screen dump is quite simple. The "screen" is scanned, interrogating each pixel encountered with Extended BASIC's *PPOINT* command. Depending on whether the pixel is "on" or "off," the instruction to write to the equivalent area on the plotter paper with either a space or a line is given. In actual practice, to speed up the plotting routine, the length of a continuous string of on or off pixels are accumulated in variables A and B, and a string variable PS$ is built containing the appropriate print commands needed to recreate the scanned line. After the complete line is scanned on the screen, the command to draw the line is sent to the plotter. Speed was an important consideration in developing this program. Several techniques were employed to achieve maximum efficiency. These include placing the main scanning routine in a tight loop at the front of the program, and utilizing the famed CPU speed-up poke. Plotting a screen dump is still time consuming, influenced by the inherent speed of the printer and the large number of lines needed to recreate the screen, as well as the use of BASIC instead of machine language. A machine language version of this program is under development.

The screen dump was designed to produce either a 1 or 2x scale enlargement with the 2x mode drawing a line twice as long for each pixel encountered on the screen. To take maximum advantage of the width of the printer, the scanning takes place vertically on the screen and is transposed horizontally to the plotter. This allows 384 (2 x 192) of the 480 possible plotting positions to be utilized in the 2x mode. *GPDUMP* works in either *PMODE3* or *4*. You are allowed to choose the color to be "sensed" by the *PPOINT* command, as well as the color to draw with. In addition, you can overlay several colors (one per pass) but be prepared to spend some time at it — a single color pass in the 1x mode takes about 15 minutes. Since the program takes considerable time to complete a pass, a "finished" buzzer has been incorporated so that the computer can be left unattended. Perhaps you can spend the time catching up on your *Rainbow* reading. If you are like me, *Rainbow* has gotten so large it is hard to find time to finish one issue before the next arrives.

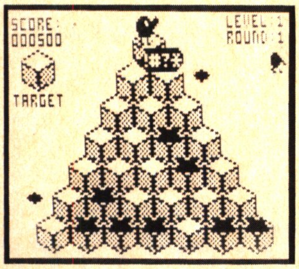
In order to test the plotting routine, a simple argyle-like mosaic is drawn as a "test pattern." Selecting the test pattern option draws the picture to the screen, then dumps it to the plotter. There are two different ways to plot a picture of your own choice. You can append a picture drawing routine of your own, taking the place of the "test pattern" which starts on line 500 in the program. An alternate technique requires that you draw your own picture on the screen and in memory using another program or graphics drawing utility. Then load in *GPDUMP* and set the *PMODE* and *SCREEN* parameters in lines 120 and 300 to the appropriate value.

If your CoCo can't handle the higher speed from the speed-up poke, delete lines 13, 240 and 250. If you do use the speed-up poke, exercise some caution — remember that if you exit the program with the [BREAK] key you should hit

---

*(Thomas Szlucha, a technical specialist/project manager of Xerox Corporation, is a frequent contributor to the* Rainbow. *He enjoys writing software as a hobby.)*

# THE TOP 4 COCO GAMES...



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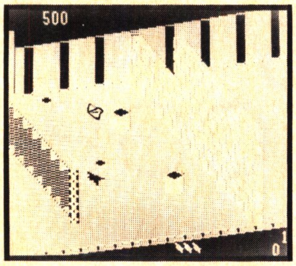

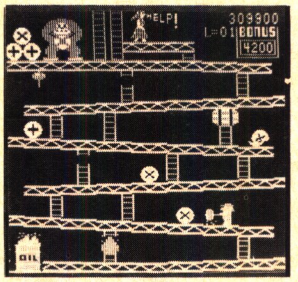

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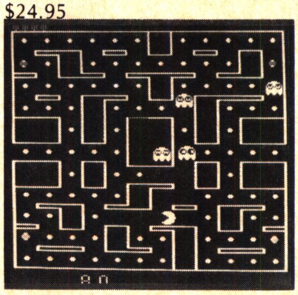

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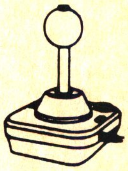

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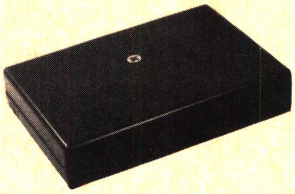

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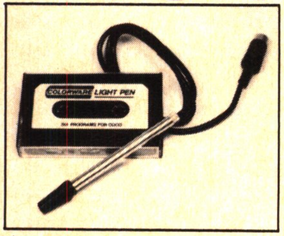

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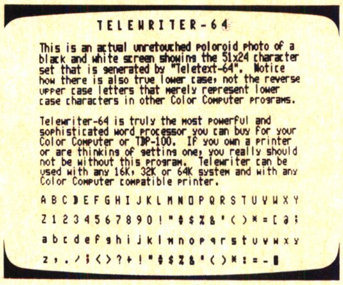

```
TELEWRITER-64

This is an actual unretouched poloroid photo of a
black and white screen showing the 51x24 character
set that is generated by "Teletext-64". Notice
how there is also true lower case, not the reverse
upper case letters that merely represent lower
case characters in other Color Computer programs.

Telewriter-64 is truly the most powerful and
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or are thinking of getting one, you really should
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used with any 16K, 32K or 64K system and with any
Color Computer compatible printer.

A B C D E F G H I J K L M N O P Q R S T U V W X Y
Z 1 2 3 4 5 6 7 8 9 0 ! " # $ % & ' ( ) * = [ @ ;
a b c d e f g h i j k l m n o p q r s t u v w x y
z , . / ; < > ? + ! " # $ % & ' ( ) * : = - █
```

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We originally planned to sell this major piece of programming for about $40.00 but decided it was so useful that no 'Real Talker' user should be without it. Besides, it really shows off the capability of 'Real Talker'.

Also included with 'Real Talker' is our unique Phoneme Editor program. It allows you to explore and create artificial speech at the phoneme level. Phenomes are the fundimental sounds or building blocks of word pronunciation. There are 64 different phenomes, as well as 4 inflection levels at your disposal. Creating and modifying speech at the phenome level is both fascinating and educational. The Phenome Editor may also be used to customize the pronunciation of speech produced by the Text-to-Speech program.

You don't have to use any of our utility programs though. If you write your own Basic Programs, you will find the pocket sized Votrax Dictionary (included free) is all you need to make your own Basic programs talk. This dictionary gives you quick access to the phenome sequences used to create approximately 1400 of the most used words in the English language.

How about compatibility? 'Real Talker' is compatible with any 16K, 32K, 64K, Extended or non-extended Color Computer. It works with any cassette or disk based system, with or without the Radio Shack Multi-slot expander. No other synthesizer under $100 can make this claim. Most other CoCo voice synthesizers require an expensive Multi-slot expander in order to work with the disk system. 'Real Talker' requires only an inexpensive Y-adapter. This is an important consideration if you plan on adding a disk or have one already.

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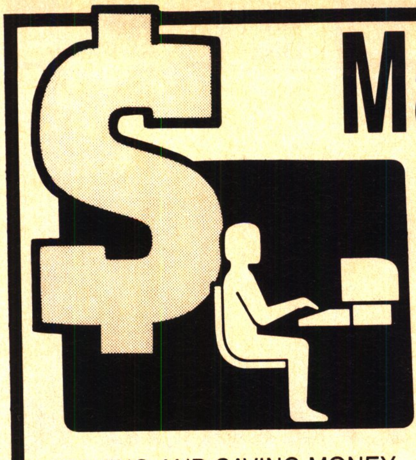
[RESET] to slow down to normal speed. Note in line 250 the computer is instructed to set the printer output to 300 Baud. In actuality, this is 600 Baud in the speed-up mode. This is a factor to keep track of if you exit the program by other than normal means.

After keying in the program, be sure that fresh pens are installed on the CGP-115. Dumps with this program will stress them. Try the test pattern or load your favorite graphics picture for a demo. A four-color dump is well worth the time spent. There is something exciting about a "hard" copy that cannot be achieved on the CRT. You should see all the miniature screen dumps that I have framed and are hanging in my office.

280 . . . . . . . . . 21
420 . . . . . . . . . 62
END . . . . . . 242

**The listing:**

```
0 CLEAR 500:AR=0:GOTO260
5 AR=1:PI=INT(PS/S+.5):FORX=255T
O0 STEP-PS:P=-S*(256-X):A=0:B=0:
PS$="":FORY=191TO0STEP-1
20 IFPPOINT(X,Y)<>CL THEN IF A=0
 THEN B=B+S:GOTO100:ELSE PS$=PS$
+"J"+STR$(A)+","+CHR$(13):A=0:B=
S:GOTO100
30 IFB=0 THEN A=A+S:GOTO100:ELSE
 PS$=PS$+"R"+STR$(B)+","+CHR$(13
):B=0:A=S
100 NEXTY
110 IF B>0 THEN PS$=PS$+"R"+STR$
(B)+","+CHR$(13)
120 IF B=192*S THEN PS$="":GOTO1
40
130 IF A>0 THEN PS$=PS$+"J"+STR$
(A)+","+CHR$(13)
140 FOR I=1 TO PI:PRINT#-2,"M"BD
",";P:PRINT#-2,PS$:P=P-1:NEXTI,X
200 CLS:PRINT"ANOTHER PASS WITH
OTHER COLORS              Y/N ":R$
= INKEY$:IF R$="Y" THEN GOTO 300
 ELSE SOUND 10,10
210 IF R$="N" THEN 220 ELSE 200
220 PRINT#-2,"M0,-100":PRINT#-2,
"A"
230 POKE 150,87:POKE65494,0
240 CLS:PRINT"FINISHED":END
260 CLS:PRINT"CGP-115 SCREEN DUM
P":PRINT:INPUT"DRAW TEST PATTERN
 Y/N";R$
270 IF R$="Y" THEN GOSUB 480
280 PS=5-PEEK(&HB6)
290 CLS:INPUT"PLOTTING SCALE 1X
OR 2X";S:IF S<1 OR S>2 THEN 290
295 S=INT(S)
300 CLS
310 IF PS=2 THEN PRINT"PMODE 3 C
OLORS                      0=BLACK
                           1=GREEN
     5=BUFF                2=YELLOW
     6=CYAN                3=BLUE
     7=MAGENTA             4=RED
     8=ORANGE"
320 IF PS=1 THEN PRINT"PMODE 4 C
OLORS                      0=BLACK
     5=BUFF                1=GREEN"
330 PRINT:INPUT"COLOR TO SENSE";
CL:IF CL<0 OR CL>8 THEN 330
340 CLS:PRINT"0=BLACK
1=BLUE         2=GREEN
3=RED"
350 PRINT:INPUT"DRAW WITH WHICH
COLOR PEN";CP:IF CP<0 OR CP>3 TH
EN 350
360 IF AR=1 THEN PRINT#-2,"H":GO
TO440
370 BD=(480-192*S)/2
390 POKE 65495,1
400 POKE 150,180
410 PRINT#-2,CHR$(18)
420 PRINT#-2,"M0,-300*S"
430 PRINT#-2,"I"
440 PRINT#-2,"C"CP
445 SCREEN1,1:PMODE3,1
450 GOTO5
470 'ARGYLE TEST PATTERN
475 'PLACE GRAPHICS HERE
476 'OR LOAD PICTURE INTO MEMORY
480 PMODE 3,1:PCLS: SCREEN1,1
490 COLOR 8,5
500 LINE(0,0)-(255,192),PSET
510 LINE(128,0)-(255,96),PSET
520 LINE(0,96)-(128,192),PSET
530 LINE(128,0)-(0,96),PSET
540 LINE(255,0)-(0,192),PSET
550 LINE(255,96)-(128,192),PSET
560 PAINT(32,48),6,8:PAINT(128,4
8),6,8:PAINT(224,48),6,8:PAINT(3
2,144),6,8:PAINT(128,144),6,8:PA
INT(224,144),6,8
570 PAINT(64,96),5,8:PAINT(192,9
6),5,8
580 PAINT(64,20),7,8:PAINT(192,2
0),7,8:PAINT(64,164),7,8:PAINT(1
92,164),7,8
590 LINE(64,0)-(255,144),PSET
600 LINE(192,0)-(255,48),PSET
610 LINE(0,48)-(192,192),PSET
620 LINE(0,144)-(64,192),PSET
630 LINE(192,0)-(0,144),PSET
640 LINE(64,0)-(0,48),PSET
650 LINE(255,48)-(64,192),PSET
660 LINE(255,144)-(192,192),PSET
665 FORT=1TO750:NEXTT
670 RETURN
```



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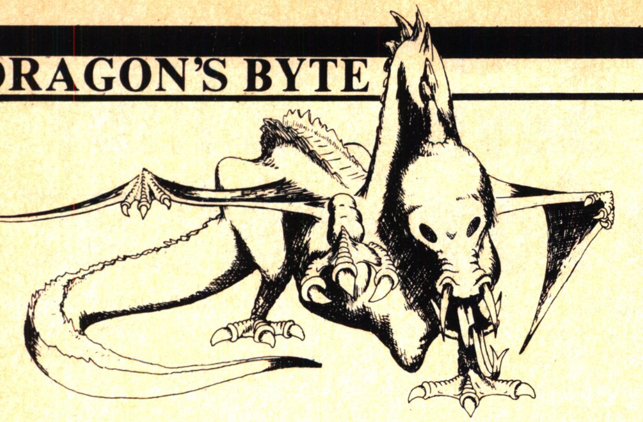

16K
Disk

# A Database Manager For Dragons

**By Bill Nolan**
***Rainbow* Contributing Editor**

This column is written for people who play fantasy role playing games like *Dungeons & Dragons*, *Runequest*, *Tunnels & Trolls*, and *Superheroes*. In this column we explore ways for players of these extremely complex games to use their computers to aid them in their enjoyment of the game. The programs we present here are not games, but rather game aids, and the games we consider are not computer games, although computers have many uses to the players and referees.

Previously, we have looked at ways to use the computer to keep some of the records which are necessary in these games, and this month we will look at that concept again, taking a more "direct" approach.

This column is aimed at users of disk systems, but some of the programming methods used are applicable regardless of the size of your system. The program below will run on any size disk system, because it uses direct access disk files.

In a sequential access filing system, the computer must start at the beginning of the file and look until it finds the desired item. Also, it is not easy to change one item in this type of file. Direct access is called that because you can go directly to any point in the file, but before we get into that, let's look at a few terms we will be using.

The three basic terms of any record-keeping system on the computer are file, record, and field. I will be using all three words repeatedly, so let's get the definitions agreed upon now. The analogy is usually made to a standard record system kept in a filing cabinet. The entire cabinet, or the whole group of file folders taken as a whole, is called the file. Each individual file folder is called a record, and each piece of information inside that folder is called a field.

*(Bill Nolan is a principal in Prickly-Pear Software, DMs a weekly game of* Dungeons & Dragons, *and teaches* Programming In BASIC *at a local college.)*

In a mailing list, then, the name, address, city, state, ZIP code, and phone number are each fields, while all of the information about one person is a record, and the entire mailing list is called a file. What we are going to learn to do is create a direct access file to store information about fantasy role playing characters.

With any filing system, whether or not it is on a computer, you must decide what kind of information you will need to store, how much of it there is, and how it is to be accessed. Only when these things are decided can the organization of the filing system proceed. By the way, a bunch of information like this is called a "database" by computer people, and a program like the one we are about to write is called a *Database Manager*.

As anyone who has played fantasy games will testify, the information on a single character will often occupy many pages. For the purpose of this program we want to keep things simple, so we are going to consider only the really basic information about a character. The items I have chosen to use are Name, Race, Sex, Class or Classes, Strength, Intelligence, Wisdom, Dexterity, Constitution, Charisma, Hit Points, Armor Class, and Level. Each of these items of information is called a field, and all of them together are referred to as a record.

When you are dealing with direct access disk files it is necessary for each record to be the same length as every other record, because the computer will be pulling them out of and inserting them into the middle of the file. Because of this, you must first decide on the length of the record, and to do this, you must decide on the length of each individual field inside the record.

Deciding how long each field will be is simply a matter of deciding how many characters you expect the longest item of that type will have, including spaces between words. For the purpose of this program I decided to allow 20 characters for the name; 10 for the race; one for the sex; 20 for the class (allowing for multi-classed); five for strength (allowing for exceptional strength); two each for intelligence, wisdom, dexterity, constitution, and charisma; three each for hit points and armor class; and five for level. If you add all these up, you will find that they total 77, and this is the number of characters in each record. All of the records created by this program will be 77 characters long, and if any field is too short, it will be filled out with blank spaces to make it the right length. As you will see, this is done easily by the computer, using a special command just for the purpose.

Before we get into the actual program, we need to decide where we are going to do what. To make that a little more clear, any program breaks down into sections, and it's a good idea to decide ahead of time what sections you will need and what line numbers you want to allocate for each section. Then, instead of working on the entire program at once, you can work on each section, and you will find the task to be much easier. This is called block programming, and in addition to making the program easier to write, it also makes it easier to change later if you need to do that.

In this program I decided that I would use lines from 10 to 999 to do any initial setup needed. You will notice that I actually needed only a few of those lines, but it was nice to know the others were there if I had to use them. Besides, you can use line numbers as high as into the 60,000s, so why cram everything together?

I used the lines from 1000 to 1100 to print out the menu and get the user's response. There are four items on the menu — print characters, add characters, change characters, and end the program — so I knew I would need four additional sections, or blocks, to handle the four choices. I put the print characters section in line 1500, the add characters section in line 4000, the change characters section in 6000, and the end program section at the end of the program, line 12000. The line numbers from 10000 to 11000 I reserved for subroutines that would be called from other places in the program. Now that we have a map of what we are going to do, we can proceed to examine the program.

In lines 10 to 25, I *DIMension* the two arrays I will use, print the title screen, and read the names of the fields into one of the arrays, NF$. The NF stands for Name of Fields, and whenever possible you should use variable names that mean something to you. The array D$ will be used to hold the *DATA* about each character. The reason for the periods in the *DATA* is to make each field name the same length, so the printout will line up.

Line 1000 simply prints the menu, 1005 gets the user's choice and checks it to make sure it is a valid entry, and 1010 branches to the four main sections of the program. Line 12000 is easy, as it clears the screen, does an unload (which closes all open files), and *ENDs* the program.

I will look at the routine located at 4000 first, as this is the add a character section, and you can't do anything else until you have put a few characters on the disk. Line 4000 is a *GOSUB* to 10200, where we remind the user that there must be a *DATA* disk in the drive (the subroutine at 11000), and then open our file. Line 10210 tells the computer to open buffer 1 for direct access to a disk file name "CHAR/DAT," with a record length of 77 characters. Line 10220 tells the computer how long each field will be, and which variable name will refer to which field. Line 10230 *RETURNS* to 4020, where the screen is cleared. Line 4030 finds out how many characters are presently in the file, and adds one to that number, so that we will create the next record number. Line 4040 tells the user which record number he is inputting, and line 4050 gets 13 *INPUTs*, one for each field, storing this information in the array D$. Line 4060 prints the information out so the user can check it, and if they approve, line 4150 does a *GOSUB* to 10100. This subroutine is a group of *LSET* statements. These not only transfer the information in the array D$ to the variables specified by the *FIELD* command, they also make everything the right length. If it is too short, it will have spaces added to the end of it, and if it is too long, it will be chopped off to fit. This command also transfers the information into buffer 1, and then the program *RETURNs* to 4160, where the contents of buffer 1 are put on the disk as record #N. Lines 4179 and 4180 find out if the user has more characters to add. If they do, it returns them to 4020, and if not, it sends them back to 1000, which is the menu.

> *"Any program breaks down into sections, and it's a good idea to decide ahead of time what sections you will need and what line numbers you want to allocate for each section . . . [so,] work on each section, and you will find the task to be much easier. This is called block programming."*

Once you have a few records in the file, you may want to print them out. The program allows you to print on the screen or printer, and to print all records or to search for and print only those records that meet certain search criteria. You can search on any field in the record. The printout routine is located starting at line 1500.

The first things the program does in this section is to set SF (the search flag) to zero, and ask the user whether they want to print all records or only specific records. If the person chooses to print all records, the variable SF stays at zero, and in line 1520 the program jumps to line 2000, skipping the search setup lines. If the person wants a search, then the program continues on line 1530 by setting the variable SF to one, indicating that a search is in progress, and printing a numbered list of the field names on the screen, so the user can choose which field is to be searched. Once the search field is entered, it is checked to be sure it is an integer from one to 13, and then the search target is prompted for. The target is the word, number, or phrase that the computer will try to match, and it must be character for character the same as what you typed in when you were adding the character. Once the target is obtained, the program goes to 2000, where the actual printout routine is located.

At line 2000, the first thing asked is whether the user wants the output printed on the screen or printer. Most of you are aware that the printer is device *#-2*, and that to print to it you use the form *PRINT#-2,"message"*. Less known is the fact that the screen is device *#0*, and that you can print to it with the command *PRINT#0,"message"*. Since you can use a variable instead of the 0 and-2, it is only necessary to assign a variable as the device number, and then set its value to be either 0 or -2. I use the variable DN for this purpose.

If the person chooses to print on the printer they are given a choice of printing continuously, or of having to press a key after each record is printed. If you have a tractor feed printer, you will want to choose continuous, but if you have a single sheet printer, you will want to choose to have the printing pause after each record so you can change the paper.

The actual printing routine starts in 2050, with the *GOSUB* to 10200 to open the buffer to the file. After finding out how many records there are in the file in line 2070, the program establishes a *FOR . . . NEXT* loop to look at each record in turn. Line 2090 *GETs* record #X, and then the program *GOSUBs* to 10000, where the *FIELDed* variables are stored in an array. This not only makes them easier to access, it is also necessary because of something which is never explained in the disk manual. You must do something with the *FIELDed* variables, which you *GET* before you close the file, because if you don't, they will go away when the file buffer is closed. By transferring them into an array, we make them less ephemeral.

Line 2097 first checks the value of SF to see if a search is in progress, and if it is, then the remainder of the line checks for a match between the target and the field previously indicated by the user. If a search is in progress, but no match is found, the line directs the program to jump past the print line, so only those records fitting the search are printed. The reason for the *LEFT$* command in line 2097 is to eliminate the spaces which may have been added to the field by the *LSET* command. If you would prefer that the program find partial matches within the field, instead of requiring an exact letter by letter match, line 2097 can be changed to read:

```
2097 IF SF=1 THEN IF INSTR(1,D$(X),TG$)<1
THEN 2120
```

The disadvantage of this is that you can get some odd matches. For instance, if you are searching for an eight in intelligence, it will also find 18, because it has an eight in it.

Line 2100 prints out the record, including the record number, which you will need to have in order to change the record, and when all of the records have been examined, the file is closed in line 2140 and the program returns to the menu at 1000.

The last section remaining is the change a character section at line 6000. First, the file buffer is opened, and the fields are specified. Then, in 6030, the user is asked which record number they want to change, and in 6045 this record is obtained from the disk and the program *GOSUBs* to 10000 to transfer the information into the array D$. In 6050 a numbered list of all the field names and their current contents is printed on the screen, and the user is asked which field they want to change. Then in 6060, the new information for the field specified is input, and in 6070 the list of field names and contents is printed on the screen again, so the user can check it. If the change was not made correctly, or if there are more fields to change, the user can indicate "not correct" in lines 6140 and 6150, and they will get a chance to make additional changes.

Once the user indicates that all is well, the program in line 6160 *GOSUBs* to 10100, where the *LSET* commands get the buffer set, and then in 6170 the new record is put back into its proper place in the disk file. In lines 6180 and 6190 you can specify more changes, and you will be returned to 6020 to pick a record number. If you say you have no more changes, the file buffer will be closed in line 6200, and line 6210 returns you to the menu.

That's about it for the line by line commentary on the program. If you do any programming at all, you will be able to fairly easily modify this filing system to be a pretty good mailing list. I did it in less than one hour. Also, if you are curious, you will be able to store about 2000 character records on a disk before it will be full. I hope you find this very basic *Database Manager* to be useful, and I hope it inspires some of you to expand it into a really complete character filing system. If you do that, be sure to send me a copy so I can see it. So, until next time, keep your swords sharp and your maces heavy, or do what I do — practice the 100-yard dash. Remember my immortal battle cry, "Run Away! Run Away!"

| | |
|---|---|
| 1510 | .... 184 |
| 2050 | .... 228 |
| 4180 | ..... 47 |
| 6200 | ..... 71 |
| END | .... 244 |

**The listing:**

```
10 CLEAR1000:CLS
15 DIM D$(13),NF$(13)
17 PRINT"CHARACTER DISK FILING S
YSTEM":PRINT"FOR USE WITH FANTAS
Y GAMES":PRINT"COPYRIGHT 1984 BY
":PRINT"BILL NOLAN":PRINT"TUCSON
, ARIZONA":PRINT"ALL RIGHTS RESE
RVED"
20 FOR X=1 TO 13:READ NF$(X):NEX
T X
25 DATA NAME..,RACE..,SEX...,CLA
SS.,STR...,INT...,WIS...,DEX...,
CON...,CHA...,HP....,AC....,LEVE
L.
35 PRINT:PRINT:GOSUB 11000
1000 CLS:PRINT:PRINT"1. PRINT CH
ARACTERS":PRINT"2. ADD CHARACTER
S":PRINT"3. CHANGE CHARACTERS":P
RINT"4. END PROGRAM":K$=INKEY$
1005 K$=INKEY$:K=VAL(K$):IF K<1
OR K>4 THEN 1005 ELSE SOUND 150,
1
1010 ON K GOTO 1500,4000,6000,12
000
1500 CLS:PRINT:PRINT"DO YOU WANT
:":SF=0
1510 PRINT:PRINT"  1. ALL RECORD
S PRINTED":PRINT:PRINT"  2. PRIN
T SPECIFIC RECORDS":PRINT:PRINT"
KEY YOUR CHOICE (1-2)":K$=INKEY$
1520 K$=INKEY$:K=VAL(K$):IF K<1
OR K>2 THEN 1520 ELSE SOUND 150,
1:IF K=1 THEN 2000
1530 SF=1:CLS:FOR X=1 TO 13:PRIN
TX;". ";NF$(X):NEXT X:INPUT"SEAR
CH FIELD # (1 TO 13)";TF:SOUND 1
50,1
1540 IF TF<1 OR TF>13 OR TF<>INT
(TF) THEN 1530
```

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(Extended BASIC required unless noted)

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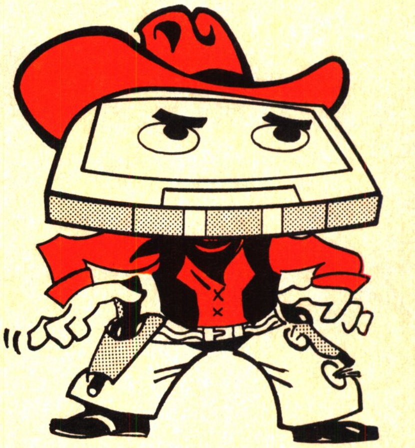
```
1550 PRINT"SEARCH TARGET?":INPUT
 TG$
2000 CLS:PRINT:PRINT"DO YOU WANT
 THIS PRINTED TO THE":PRINT"SCRE
EN, OR THE PRINTER? (S/P)":K$=IN
KEY$
2010 K$=INKEY$:IF K$<>"S" AND K$
<>"P" THEN 2010 ELSE SOUND 150,1
:IF K$="P" THEN DN=-2 ELSE DN=0
2015 IF DN=0 THEN PP=1
2020 IF DN=-2 THEN PRINT:PRINT"D
O YOU WANT THE ACTION TO BE":PRI
NT"CONTINUOUS, OR DO YOU WANT A"
:PRINT"PAUSE AFTER EACH QUESTION
? (C/P)":K$=INKEY$
2030 IF DN=-2 THEN K$=INKEY$:IF
K$<>"C"AND K$<>"P" THEN 2030 ELS
E SOUND 150,1:IF K$="P" THEN PP=
1 ELSE PP=0
2040 IF DN=-2 THEN CLS:PRINT"YOU
 SELECTED THE PRINTER.":PRINT"MA
KE SURE IT'S ON LINE NOW.":GOSUB
 10500
2050 GOSUB 10200
2070 N=LOF(1)
2080 FOR X=1 TO N
2090 GET #1,X
2095 GOSUB 10000
2097 IF SF=1 THEN IF TG$<> LEFT$
(D$(TF),LEN(TG$)) THEN 2120
2100 CLS:PRINT#DN,"RECORD #";X:F
OR Y=1 TO 13:PRINT#DN,NF$(Y);D$(
Y):NEXT Y
2110 IF PP>0 THEN GOSUB 10500:CL
S
2120 NEXT
2130 CLOSE#1
2140 GOTO 1000
4000 GOSUB 10200
4020 CLS
4030 N=LOF(1)+1
4040 PRINT"YOU ARE ON RECORD #";
N
4050 FOR X=1 TO 13:PRINTNF$(X);:
INPUT D$(X):SOUND 150,1:NEXT X
4060 CLS:FOR X=1 TO 13:PRINTNF$(
X);:PRINT D$(X):NEXT X:PRINT"IS
THIS CORRECT? (Y/N)":K$=INKEY$
4140 K$=INKEY$:IF K$<>"Y"AND K$<
>"N" THEN 4140 ELSE SOUND 150,1:
IF K$="N" THEN 4020
4150 GOSUB 10100
4160 PUT #1,N:CLS
4170 PRINT"DO YOU HAVE MORE? (Y/
N)":K$=INKEY$
4180 K$=INKEY$:IF K$<>"Y" AND K$
<>"N" THEN 4180 ELSE SOUND 150,1
:IF K$="Y" THEN 4020
4190 CLOSE #1
4200 GOTO 1000
```

```
6000 GOSUB 10200
6020 CLS
6030 INPUT"CHANGE WHAT RECORD #"
;N
6040 IF N<1 OR N>LOF(1) THEN PRI
NT"INVALID NUMBER":FOR X=1 TO 20
00:NEXT:GOTO 6020
6045 GET#1,N:GOSUB 10000
6050 CLS:FOR X=1 TO 13:PRINT X;"
. ";:PRINTNF$(X);:PRINT D$(X):NE
XT X:INPUT"FIELD # TO CHANGE (1-
13)";TF:SOUND 150,1
6060 IF TF<1 OR TF>13 OR TF<>INT
(TF) THEN 6050 ELSE PRINT"NEW IN
FORMATION?":INPUT D$(TF)
6070 CLS:FOR X=1 TO 13:PRINT X;"
. ";:PRINTNF$(X);:PRINT D$(X):NE
XT X
6140 PRINT"IS THIS CORRECT (Y/N)
":K$=INKEY$
6150 K$=INKEY$:IF K$<>"Y"AND K$<
>"N" THEN 6150 ELSE SOUND 150,1:
IF K$="N" THEN 6050
6160 GOSUB 10100
6170 PUT #1,N:CLS
6180 PRINT"DO YOU HAVE MORE? (Y/
N)":K$=INKEY$
6190 K$=INKEY$:IF K$<>"Y" AND K$
<>"N" THEN 6190 ELSE IF K$="Y" T
HEN 6020
6200 CLOSE #1
6210 GOTO 1000
10000 D$(1)=N$:D$(2)=R$:D$(3)=S$
:D$(4)=C$:D$(5)=ST$:D$(6)=IN$:D$
(7)=WI$:D$(8)=DE$:D$(9)=CO$:D$(1
0)=CH$:D$(11)=HP$:D$(12)=AC$:D$(
13)=L$:RETURN
10100 LSET N$=D$(1):LSET R$=D$(2
):LSET S$=D$(3):LSET C$=D$(4):LS
ET ST$=D$(5):LSET IN$=D$(6):LSET
 WI$=D$(7):LSET DE$=D$(8):LSET C
O$=D$(9):LSET CH$=D$(10):LSET HP
$=D$(11):LSET AC$=D$(12):LSET L$
=D$(13):RETURN
10200 CLS:GOSUB 11000
10210 OPEN"D",#1,"CHAR/DAT",77
10220 FIELD #1,20 AS N$,10 AS R$
,1 AS S$,20 AS C$,5 AS ST$,2 AS
IN$,2 AS WI$,2 AS DE$,2 AS CO$,2
 AS CH$,3 AS HP$,3 AS AC$,5 AS L
$
10230 RETURN
10500 PRINT"PRESS ANY KEY TO CON
TINUE"
10510 IF INKEY$="" THEN 10510 EL
SE SOUND 150,1:RETURN
11000 PRINT"MAKE SURE THE DATA D
ISK IS IN":PRINT"THE DRIVE.":GOS
UB 10500:RETURN
12000 CLS:UNLOAD:END
```

# Chromasette vs. the other guy



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# Synchronous Output Can Be Useful

### By James Provost

Here is a very useful program for Adventures and other text programs where a hard copy of what is on the screen is needed. *SYNC* is designed to produce a syncronous output to both screen and printer.

The user should make sure that his/her printer is on-line before *RUNning* the program or else the computer will "hang." The syncronous output will be in effect until the computer is powered down.

For users with 64K — while in the 64K mode, *POKE &HA1A5,&H12* to achieve a solid cursor. This places a NOP into the address which formerly held the instruction for the cursor to change to another color.

Description

```
3E8     34 54       PSHS U,X,B    save registers
3EA     BD A2BF     JSR $A2BF     output character in A
                                  register to printer
3ED     35 54       PULS B,X,U    restore registers
3EF     39          RTS           return
```

The following memory locations must also be true:

$0168 = $03 $0169 = $E8

**The listing:**

```
1 REM SYNC
2 REM BY JAMES PROVOST
10 FOR X=1000 TO 1007
20 READ A:POKE X,A
30 NEXT
40 POKE 360,3:POKE 361,232
50 DATA 52, 84, 189, 162, 191
60 DATA 53, 84, 57
```

*(James Provost holds an associate's degree in computer electronic technology and free-lances in educational software programming. He resides in Stoneham, MA.)*

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## QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

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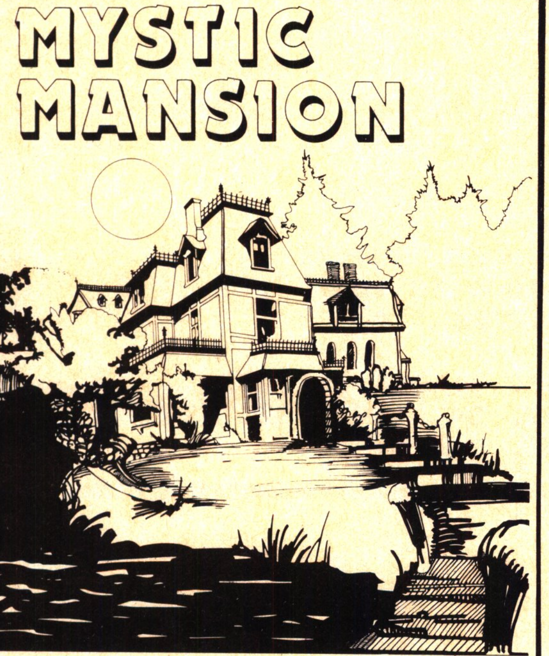
**STRUCTURED MACROS** – An assembly language programming tool for users of the Macro-80C assembler, by the Micro Works. Structured macros come close to transforming your assembler into a high-level language. Your programs become more understandable and debugging is simplified. Commands include IF, ELS, ENDIF, IFTST, IFCC, WHILE, ENDWH, REPEAT, and UNTIL. **Disk $19.95.**

**PAGE PLUS** – Attention BASIC programmers! Up to 56K available from your BASIC programs. This utility, written by Chris Hawks, does the memory management necessary to utilize the two 32K banks of memory. Easy enough for any "intermediate" level BASIC programmer to use. Works with 64K systems. **Cassett $27.95.** **Disk $29.95.**



**MYSTIC MANSION** – New!! You'll be hearing lots about this incredible **ALL GRAPHIC** adventure. Explore the mansion and escape from the island, if you can! This one is tough to solve, but you'll have fun trying. For 32K Disk only. **Disk $29.95.**

# C.C. Three

A powerful 'electronic spreadsheet', a full-featured word processor, and a flexible database - for an unheard of low price! This may be the **ONLY SOFTWARE PACKAGE YOU'LL EVER NEED TO BUY** for your computer.

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**MDISK** – Hal Snyder's latest breakthrough for the 64 Color Computer! MDISK lets you use the upper 32K of memory for rapid storage and retrieval of programs and data. Whether you own an actual disk drive or not, MDISK puts the "hidden" 32K to work for you as a "virtual disk," with capability to save and load up to 15 programs, view a directory of files stored in "page 1," kill unwanted page 1 files, execute BASIC or machine language directly from MDISK, chain to a BASIC program while preserving data already created, and more. MDISK is written in position independent code, and will work on disk or tape based 64K systems. **Cassette $27.95.** **Disk $29.95.**

**ROMBACK** – Why pay more? The easiest to use ROM-pak dumping utility available! At the best price, too! Comes with full documentation, including detailed patching instructions to allow several popular "problem" cartridges to run from tape or disk. 64K Extended BASIC. **Cassette $16.95.**

**QUICKSORT** – A machine language sort routine specifically designed to be used by BASIC programmers. Written in position independent code, works on tape or disk systems. 16K required. **Cassette $12.95.**

**64K BOOT/PAGER** – The 64K Boot allows you to modify BASIC by moving it from ROM to RAM. The PAGER is a menu-driven utility allowing you to manually page between the 32K banks of memory. Source code for both programs is included. Both run on 64K tape or disk systems. **Cassette $19.95**

**WIZARD 64** – If you've got 64K, then this one's for you! Uses both 32K pages of memory for graphics and action. Challenging enough for adults, yet entertaining for younger players too. 64K Extended BASIC. **Cassette $21.95** **Disk $23.95.**

**SIMPLEX** – Linear programming by the "simplex" method now available for the Color Computer. This powerful decision making tool finds the optimum "mix" for a given set of constraints. Disk compatible. 16 page manual included. 16K Extended BASIC. **Cassett $29.95.**

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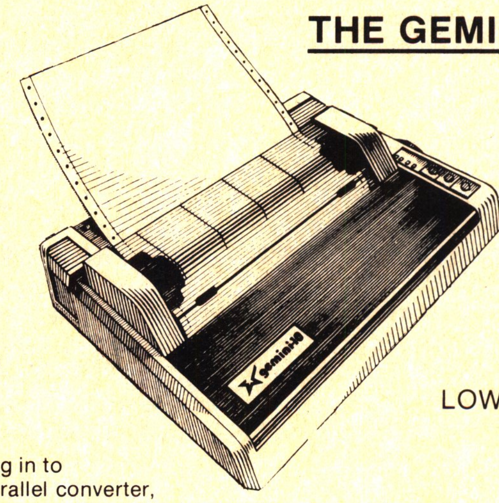

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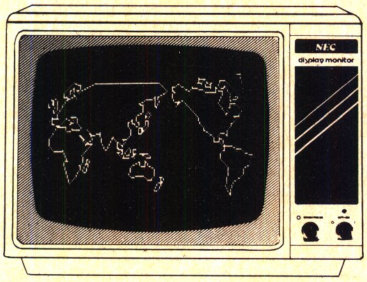

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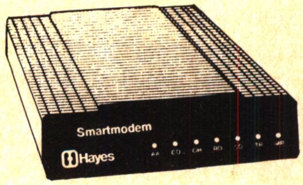

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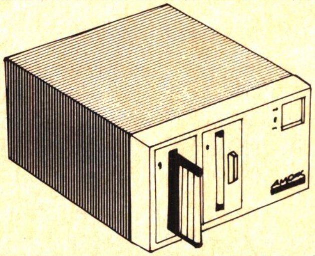

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(soldering required on Color Computer 2)

# PIPELINE

**RADIO SHACK** has released several new products this month. Among the best is the C-Compiler, a versatile and efficient programming language for the 64K Color Computer and the OS-9 disk operating system. The C-Compiler can easily handle tasks that previously would have required complex assembly language programming. Programs written in C are more portable between radically different computer systems than other standardized languages such as BASIC COBOL, and PASCAL, and it works particularly well with the 64K CoCo because the 6809 microprocessor was designed specifically to run high-level languages. (For more information, see Dale Puckett's "KISSable OS-9" column on Page 297.) The C-Compiler is available for $99.95 at Radio Shack stores nationwide.

Also introduced for the 16K or greater CoCo is *Personal Finance II*, a program that aids the user in setting up a budget, tracking bank accounts, and evaluating expenditures. It can keep track of nine bank accounts and 25 budget categories, store 1,818 checks on tape, and is available on cassette for $34.95.

For the MC-10, Radio Shack has introduced *Math Design* and *Lost World Pinball*. The *Math Design* package contains two packages: *MiniCalc*, which functions as a hand-held calculator, and *Spirals*, a fun geometric exercise that makes it possible to design and plot a large variety of polygonal spirals in four colors. Both are available on cassette for $9.95 each at all participating Radio Shack stores.

* * *

**A $10,000 SCHOLARSHIP** has been announced by Ray Jacobs, president of Software City. It will be awarded to the student who produces the most marketable computer program. In addition, four $1,000 scholarships are offered to the runners-up.

Applicants must have been graduated from high school after Jan. 1, 1984, and entries must be submitted by Dec. 31, 1984.

Categories in which entries will be judged are: Business Applications, Education, Home Applications, Recreation and Systems Software.

Requests for complete information and scholarship applications should be directed to: Software City Corporate Headquarters, 1415 Queen Anne Road, Teaneck, NJ 07666, Attention: Scholarship Director.

* * *

**THE PRICE OF SECURITY.** ADM Concepts has announced the introduction of a new low-cost data system security link called the COMMLOCK Model-96A. It has been designed to be compatible with all standard asynchronous data communication systems.

COMMLOCK's design provides for a virtual secured communication link to corporate, military and private computer data banks. The COMMLOCK link must, however, be installed between the computer and modem at both the transmission and reception sites.

Using this dual encryption method, though, is far more secure than the more common single encryption. Also, COMMLOCK is programmable by the user for creation of up to 1,024 unique encryption codes. It is programmable for data rates (300 to 9600 bits per second), word length (5 to 8 bits), and parity and number of stop bits — which makes it compatible with all asynchronous communications.

At $600 in single-piece quantities, COMMLOCK provides a low cost solution to the data security needs of large corporations and the military, but for personal computer networks, putting your trust in the gods for security is, let's face it, a heck-of-a-lot cheaper.

* * *

**COCO CELEBRITY** Bob Rosen says that he liked California so well when he attended the RAINBOWfest in Long Beach, he has decided to pack his bags and go west. And that means that Spectrum Projects will be expanding. In April, Bob will be opening the West Coast Division of Spectrum Projects and, in conjunction with that, he will be warming up four more of his popular Rainbow Connection bulletin board systems. The new West Coast address is #9866, 4285 Payne Ave., San Jose, CA 95117.

Not to worry, Easterners — Bob's brother, Paul, will continue to operate their East Coast offices in Woodhaven, NY.

* * *

**KEEPIN' AN EYE ON COCO.** Micron Technology, Inc., a western memory chip manufacturer, has introduced two new products that give the gift of sight to your favorite computer. Both the MicronEye Bullet and the MicronEye Camera make use of a revolutionary image-sensing chip — the IS32 OpticRAM. This chip is composed of 65,536 individual pixels and is capable of sending remarkably high resolution images to the screen of most computers.

Uses for the MicronEye are virtually unlimited and include: character recognition, signature verification, graphics input, automated monitoring, surveillance and motion detection, barcode reading, robot vision, and the list goes on. What does seem somewhat limited, however, are the MicronEye's capabilities with the CoCo in comparison to other computers. These seem to include the inability to store and recall pictures from disk and the inability to dump to a printer — two pretty important features.

The entire package for the Bullet, including camera, lens, tripod, interface card and software, is priced at $295 — it might have cost $30,000 two years ago. You can write to Micron Technology at 2805 East Columbia Rd., Boise, ID 83706.

* * *

**AT LAST, *VIP CALC*** has arrived at *the Rainbow's* editorial offices and this long-awaited spreadsheet program appears to be powerful. It is completely compatible with all the other programs in the VIP Library and features memory sense-bank switching, true lowercase, 16 video display windows, 15-digit precision, and other features of the VIP Library. We understand that Softlaw has been shipping *VIP Calc* for several weeks now.

*VIP Calc* comes packaged in a handsome, 5½ x 8½ inch, three-ring binder; somewhat smaller than the old Super "Color" binders, but just as attractive and functional. The package contains both disk and cassette versions of the program and 178 pages of documentation. Both the disk and tape contain separate 32K and 64K versions of the program; the 32K version does not have Hi-Res displays or the sort and edit functions featured on the 64K version.

*VIP Calc* is available for $59.95 from Softlaw, 9072 Lyndale Avenue So., Minneapolis, MN 55420.

To better service the CoCo community

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# SPECTRUM PROJECTS

## SOFT AND HARD WARES FOR COLORFUL COMPUTING

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## COMMUNICATION

COLORCOM/E - A complete smart terminal package! Upload, Download, Hi-Res (51X24) screen, 300/1200 Baud, Offline Printing and much more. Rompak or Disk - $49.95

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TELEWRITER-64 - Top CoCo Word Processor for 2 years! Three Hi-Res screens, true lowercase characters, right justification, full screen editor.
Tape $49.95 Disk $59.95

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PRO-COLOR FILE - 60 Data Fields, 8 Report Formats, 1020 bytes/record, Sorts 3 Fields, Screen and Summary Reports, Duplicate Records and Fields, Page Titles - Disk $79.95

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DRIVE 0 System - 40 trks, Gold Platted Connectors - $349.95
AMDEK System - 624K Bytes with 3" Disk Cartridge - $599.00
DISK CONTROLLER - $139.95
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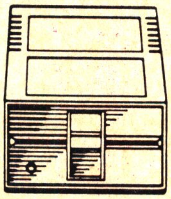

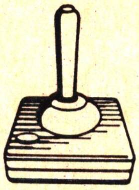

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With 2 Atari joysticks- $39.95
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| 1. FHL O-PAK | $34.95 |
| 2. Disk Doctor | $39.95 |
| 3. Super Forth | $39.95 |
| 4. Super Screen Machine | $49.95 |
| 5. OS-9 | $69.95 |
| 6. FHL Flex | $69.95 |
| 7. MicroWorks EDTASM | $99.95 |

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| 2 | 10% |
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| | |
|---|---|
| 1. Cubix | $24.95 |
| 2. Calixto Island | $24.95 |
| 3. The King | $26.95 |
| 4. Guardian | $27.95 |
| 5. Junior's Revenge | $28.95 |
| 6. Colorpede | $29.95 |
| 7. Zaxxon | $39.95 |

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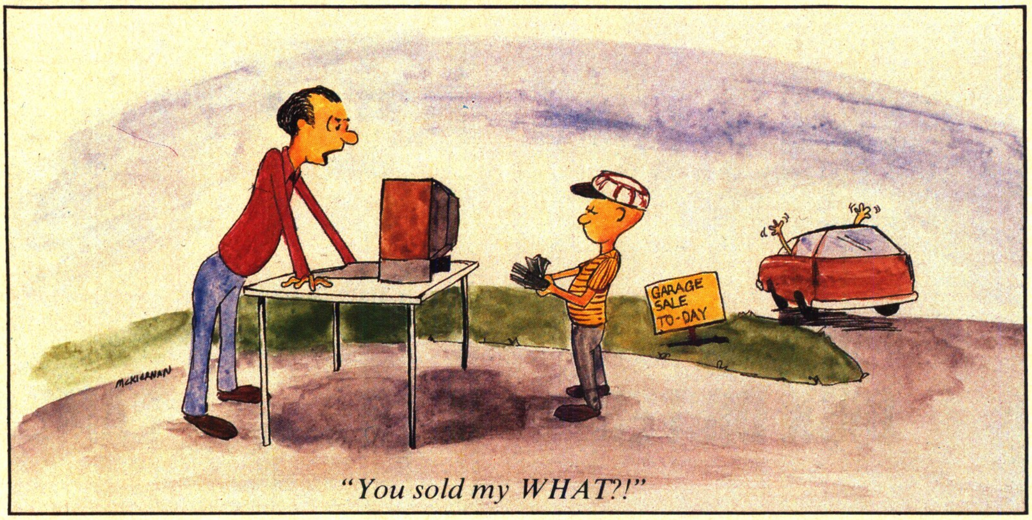
**HOME HELP**

**16K ECB**

# The Most Professional Garage Sale In The Neighborhood

*By Edward R. Carson*



*"You sold my WHAT?!"*

Here is a garage sale program that will do it all for you. No more scribbling on a scratch pad, trying to keep track of everyone's money. Just *CLOAD Garsale* and you have a cash register that will ask for: Sellers, Price Of Item, and Quantity. It will give you the Total Amount Of Sale, then ask for the Amount Tendered and tell you the Amount Of Change.

As an added attraction you can put any message you want on the screen. Do you have a special item you want to advertise? Well, just put it on the screen where everyone can see it. This is sure to be an eye-catcher.

You can change the message any time. All instructions are documented on the screen except while the message is there. You must hit [CLEAR] to return to the sellers list.

At the end of the day just ask and you will receive the total amount sold for the day and the amount each person should receive.

If you don't have enough memory for the entire program you can delete the message portion as follows:

Delete lines 5-775
Delete lines 885-895
Delete lines 1535-1555
Change line 1575 to — "GOTO 935"

---

*(Edward Carson is a senior majoring in finance at Ohio State University.)*

| | |
|---|---|
| 105 | 117 |
| 255 | 132 |
| 405 | 149 |
| 555 | 90 |
| 705 | 217 |
| 985 | 207 |
| 1215 | 78 |
| 1465 | 21 |
| END | 173 |

**The listing:**

```
1 PRINT"-----------GARAGE SALE---
--------"
2 PRINT:PRINT:PRINT"COPYRIGHT (C
) SEPT.20,1983          BY EDWARD
R CARSON"
3 PRINT"   CENTERBURG,OHIO"
4 FOR T=1 TO 900:NEXT T
5 CLS:DIM A$(95):GOSUB 145:GOSUB
785
15 CLS:PRINT "DO YOU WANT (1)SMA
LL (2)MEDIUM (3)LARGE":INPUT CH
25 IF CH =1 THEN Y=-16:YY=16:XX=
12:S=1 ELSE IF CH=2 THEN Y=-32:Y
Y=32:XX=24:S=2 ELSE IF CH=3 THEN
 Y=-64:YY=64:XX=48:S=4 ELSE 15
35 IF CH=1 THEN CLS:PRINT "ENTER
 NEXT LINE(21 CHARACTERS)" ELSE
```

# THE SPECTRUM VOICE PAK

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Price good with purchase of any Talking Software below ! Offer expires May 25, 1984

**$69.95 CoCo I**

New Features ! Single key echo and phoneme printouts ! Works w/$29.95 Disk"Y" cable!

**$79.95 CoCo II**

Includes adapter to work on 16K-64K CoCo II's. Same features as CoCo I. In stock!

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**Talking Final Countdown** - You must stop the mad general from launching a missle at the Russians and causing WW III ! Has multiple voices for added realism. 32K EXT **$24.95**

**Educational Software** - Computer Island's educational programs turn your CoCo into a true teaching machine. Reinforce basic lessions with the aid of voice. Three/pak special includes Math Drill, Spelling Tester and Foreign Languages. 16K EXT **$24.95**

**Talking Score E-Z** - An excellent adaptation of a Yahtzee type program with added speech. Up to 6 players can compete at a time, and all scoring and record keeping is done by the computer. 32K EXT **$24.95**

**Term Talk** - A speaking smart terminal program for your CoCo. It contains all the features of an intelligent communications package, plus it talks! (Shades of War Games) 16K EXT Tape **$39.95** Disk **$49.95**

**All orders plus $3.00 S/H - NY Residents add sales tax**

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**MULTI-PAK CRAK** - Save ROMPAKs to your 64K Disk system using the RS Multi-Pak Interface. Eliminate constant plugging in of ROMPAKs now by keeping all your PAK software on disk. DISK **$24.95**

**TAPE OMNI CLONE** - Easily handles programs with auto loaders, no headers, no EOF markers, unusual size blocks and more! Now is the time to get your tape software collection protected against loss. TAPE **$24.95**

**DISK OMNI CLONE** - Back everything up! This amazing program handles "non standard" disks with ease. We haven't found any disk yet that it can't handle. Lowest price too! 32K DISK **$29.95**

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**BASIC AID** - Speed program entry by single key input of 43 common BASIC commands. Redefine any or all keys. Merge, move and renumber any part of your program. **SPECTRUM SUPER SPECIAL!** ROMPAK ~~$34.95~~ **$29.95**/DISK ~~$49.95~~ **$39.95**

**MASTER DESIGN** - Attention Telewriter 64 owners. Now you can create stunning block letter heads while text processing with Master Design. Full range of character sizes and graphic commands! DISK **$34.95**

**BASIC COMPILER** - Convert your BASIC programs into fast efficient machine language. Produces code more compact and up to 50Xs faster than original BASIC. Integer compiler with no Extended BASIC needed. 16K-64K versions included. TAPE **$39.95**

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**HIDDEN BASIC** - A protection feature for your BASIC programs. Modify your code so CLOAD, CSAVE, LIST, EDIT, DEL and LLIST will not function. TAPE **$19.95**

**64 COLUMN MOD I/III EMULATOR** - Give your CoCo a 64X16 screen. Run Model I/III BASIC graphic routines without retyping the graphics statements. 64K DISK **$19.95**

**64K DISK UTILITY PACKAGE** - Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridges to disk and create a 32K SPOOL buffer for printing. DISK **$21.95**

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**E-X-T-E-N-D-E-D DISK BASIC** - Add new powerful commands to your 64K Disk system. Inverse Video (GREAT for monitors!), Wild Card Directory, Double POKE and PEEK, NSAVE, NLOAD, LDIR, OLD and TYPE. DISK **$24.95**

**GRAPHICOM** - The ultimate CoCo graphics development system with sophisticated graphics editing, preview animation, telecommunications and printer support. Hi-resolution graphics for only **$24.95.** W/Spectrum's Menu Foot Switch **$34.95.** 64K DISK

COLORFUL UTILITY CHECK LIST:

( ) DOUBLE DOS
( ) MULTI-PAK CRAK
( ) TAPE OMNI CLONE
( ) DISK OMNI CLONE
( ) DISK MANAGER
( ) BASIC AID
( ) MASTER DESIGN
( ) BASIC COMPILER
( ) SCHEMATIC DRAFTING
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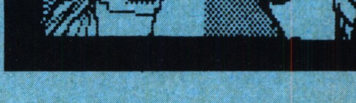
( ) HIDDEN BASIC
( ) 64 COL MOD I/III EMULATOR
( ) 64K DISK UTILITY PACKAGE
( ) TAPE UTILITY
( ) E-X-T-E-N-D-E-D DISK BASIC
( ) GRAPHICOM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```
IF CH=2 THEN CLS:PRINT "ENTER NE
XT LINE (10 CHARACTERS)" ELSE IF
CH=3 THEN CLS:PRINT "ENTER NEXT
LINE (5 CHARACTERS)"
45 A$="":LINE INPUT A$:CLS
55 IF A$="" GOTO 35
65 PMODE 4,1:SCREEN 1,0
75 COLOR 0,1:IF Y=-YY THEN PCLS
85 Y=Y+YY:P=0:FOR X=0 TO (LEN(A$
)-1)*XX STEP XX
95 XY$="S"+STR$(S)+"BM"+STR$(X)+
","+STR$(Y)
105 P=P+1:N=ASC(MID$(A$,P,1))
115 DRAW XY$+A$(N)
125 NEXT
135 A$=INKEY$:IF A$=CHR$(13) THE
N 35 ELSE IF A$=CHR$(12) THEN 93
5 ELSE 135
145 A$(33)="BR16R8D40L8U40BD48R8
D8L8U8"
155 A$(34)="BR8R8D24L8U24BR16R8D
24L8U24
165 A$(35)="BR8R8D16R8U16R8D16R8
D8L8D8R8D8L8D16L8U16L8D16L8U16L8
U8R8U8L8U8R8U16BD24BR8R8D8L8U8"
175 A$(36)="BR16R8D8R16D8L16D8R8
F8D8G8L8D8L8U8L16U8R16U8L8H8U8E8
R8U8BD16D8H4E4BD16BR8F4G4U8"
185 A$(37)="R16D16L16U16BD4BR40G
49D8E49U8BD36BL16R16D16L16U16"
195 A$(38)="BR8R8F8D16G4F8E4R8D8
G4F4D8L8H4G4L16H8U16E4H4U16E8BD8
BR4F4D8G4H4U8E4BD24F12G4L8H4U8E4
"
205 A$(39)="BR16R8D24L8U24"
215 A$(40)="BR16R8G16D24F16L8H16
U24E16"
225 A$(41)="BR16R8F16D24G16L8E16
U24H16"
235 A$(42)="BR16R8D16E8R8D8G12F1
2D8L8H8D16L8U16G8L8U8E12H12U8R8F
8U16"
245 A$(43)="BD24R16U16R8D16R16D8
L16D16L8U16L16U8"
255 A$(44)="BD32BR16R8D16G8L8E8U
16"
265 A$(45)="BD24R40D8L40U8"
275 A$(46)="BD48BR16R8D8L8U8"
285 A$(47)="BD4BR40D8G40U8E40"
295 A$(48)="BR8R24F8D40G8L24H8U4
0E8BD8BR4R16F4G24U24E4BD12BR20D2
4G4L16H4E24"
305 A$(49)="BR16R8D48R8D8L24U8R8
U32L8U8E8"
315 A$(50)="BR8R24F8D8G32R32D8L4
0U8E32U4H4L16G4D4L8U8E8"
325 A$(51)="BR8R24F8D16G4F4D16G8
L24H8U8R8D4F4R16E4U8H4L8U8R8E4U8
H4L16G4D4L8U8E8"
335 A$(52)="BR24R8D32R8D8L8D16L8
U16L24U16E24BD8D24L16U8E16"
345 A$(53)="R40D8L32D8R24F8D24G8
L24H8U8R8D4F4R16E4U16H4L28U24"
355 A$(54)="BR8R24F8D8L8U4H4L16G
4D12R24F8D16G8L24H8U40E8BD32R20F
4D8G4L16H4U12"
365 A$(55)="R40D8G32D16L8U16E32L
32U8"
375 A$(56)="BR8R24F8D16G4F4D16G8
L24H8U16E4H4U16E8BD8BR4R16F4D8G4
L16H4U8E4BD24R16F4D8G4L16H4U8E4"
385 A$(57)="BR8R24F8D40G8L24H8U8
R8D4F4R16E4U12L24H8U16E8BD8BER4R
16F4D12L20H4U8E4"
395 A$(58)="BD16BR16R8D8L8U8BD16
R8D8L8U8"
405 A$(59)="BD16BR16R8D8L8U8BD16
R8D16G8L8E8U16"
415 A$(60)="BR34D8G20F20D8H28E28
"
425 A$(61)="BD16R40D8L40U8BD16R4
0D8L40U8"
435 A$(62)="BR7F28G28U8E20H20U8"
445 A$(63)="BR8R24F8D8G16D8L8U8E
16U4H4L16G4D4L8U8E8BD48BR8R8D8L8
U8"
455 A$(64)="BR8R24F8D24G8L16U24R
8D8R8U12H4L16G4D32F4R28D8L32H8U4
0E8"
```

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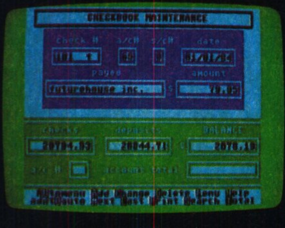
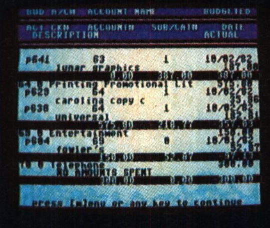


1



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3

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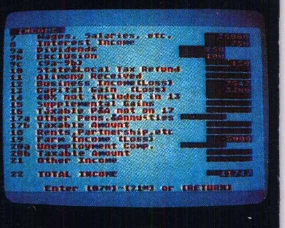

5

actual screen display *indicates function being shown

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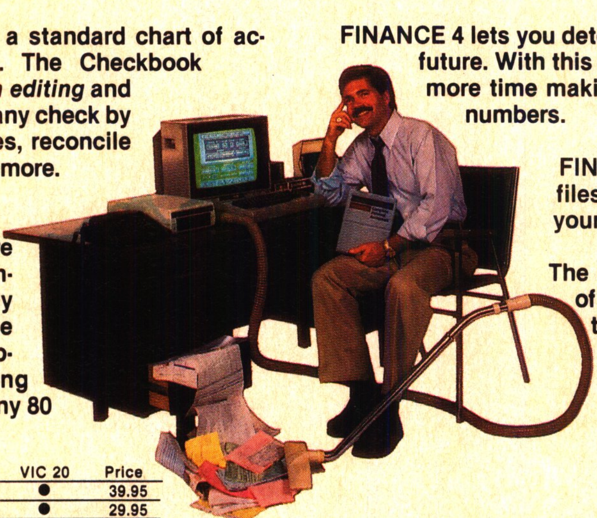

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```
465 A$(65)="BR16R8F16D40L8U24L24
D24L8U40E16BD8BR4F12D4L24U4E12
475 A$(66)="R32F8D16G4F4D16G8L32
U56BF8R20F4D8G4L20U16BD24R20F4D8
G4L20U16"
485 A$(67)="BR8R24F8D8L8U4H4L16G
4D32F4R16E4U4R8D8G8L24H8U40E8"
495 A$(68)="R32F8D40G8L32U56BF8R
20F4D32G4L20U40"
505 A$(69)="R40D8L32D16R24D8L24D
16R32D8L40U56"
515 A$(70)="R40D8L32D16R24D8L24D
24L8U56"
525 A$(71)="BR8R24F8D8L8U4H4L16G
4D32F4R16E4U4L8U8R16D16G8L24H8U4
0E8"
535 A$(72)="R8D24R24U24R8D56L8U2
4L24D24L8U56"
545 A$(73)="BR8R24D8L8D40R8D8L24
U8R8U40L8U8"
555 A$(74)="BR32R8D48G8L24H8U8R8
D4F4R16E4U44"
565 A$(75)="R8D24E24R8G28F28L8H2
4D24L8U56"
575 A$(76)="R8D48R32D8L40U56"
585 A$(77)="R8D12F12E12U12R8D56L
8U36G12H12D36L8U56"
595 A$(78)="R8D12F24U36R8D56L8U1
2H24D36L8U56"
605 A$(79)="BR8R24F8D40G8L24H8U4
0E8BD8BR4R16F4D32G4L16H4U32E4"
615 A$(80)="R32F8D16G8L24D24L8U5
6BF8R20F4D8G4L20U16"
625 A$(81)="BR8R24F8D36G4F4G4H4G
4L20H8U40E8BD8BR4R16F4D32H4G4F4L
16H4U32E4"
635 A$(82)="R32F8D16G8L16F24L8H2
4D24L8U56BF8R20F4D8G4L20U16"
645 A$(83)="BR8R24F8D8L8U4H4L16G
4D8F4R20F8D16G8L24H8U8R8D4F4R16E
4U8H4L20H8U16E8"
655 A$(84)="R40D8L16D48L8U48L16U
8"
665 A$(85)="R8D44F4R16E4U44R8D48
G8L24H8U48"
675 A$(86)="R8D36F12E12U36R8D40G
16L8H16U40"
685 A$(87)="R8D36E12F12U36R8D56L
8U12H12G12D12L8U56"
695 A$(88)="R8D12F12E12U12R8D16G
12F12D16L8U12H12G12D12L8U16E12H1
2U16"
705 A$(89)="R8D12F12E12U12R8D16G
16D24L8U24H16U16"
715 A$(90)="R40D12G32D4R32D8L40U
12E32U4L32U8"
725 A$(91)="R40D8L24D40R24D8L40U
56"
735 A$(92)="BD4F40D8H40U8"
745 A$(93)="R40D56L40U8R24U40L24
U8"
755 A$(94)="BD34E20F20D8H20G20U8
"
765 A$(95)="BD48R40D8L40U8"
775 RETURN
785 CLS
795 Z$=STRING$(32,"$")
805 PRINT Z$
815 PRINT@42,"GARAGE SALE"
825 PRINT Z$
835 PRINT "HOW MANY ARE SELLING"
845 INPUT S
855 FOR Y=1 TO S
865 PRINT"NAME OF SELLER #"(Y)
875 INPUT N$(Y)
885 IF (Y)=S THEN895 ELSE 925
895 CLS:PRINT"DO YOU HAVE A MESS
AGE? [Y/N]";
905 INPUT M$
915 IFM$="Y" THEN 15 ELSE 935
925 Y=Y+1:GOTO 865
935 Y=Y+1:CLS:PRINTZ$
945 FOR X=1 TO S-1 STEP 6
955 FOR Z=X TO X+6
965 PRINT Z;N$(Z)
975 NEXT Z
985 NEXT X
995 PRINT"     INPUT SELLERS NO."
1005 PRINT @417,"TYPE [99] TO TO
```

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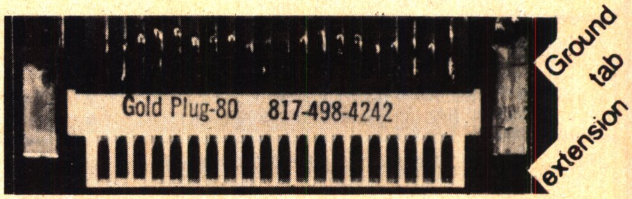

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```
TAL DAYS SALES   TYPE [91] TO RU
N MESSAGE "
1015 INPUT N
1025 IF N=99 THEN 1425 ELSEIF N=
91 THEN 65 ELSE1035
1035 CLS:PRINT Z$
1045 PRINT"SALES FOR " N$(N)
1055 PRINT Z$
1065 PRINT"PRICE OF ITEM";:INPUT
 PR
1075 PRINT"QUANTITY";: INPUT Q
1085 PRINT
1095 ON N GOTO 1105,1115,1125,11
35,1145,1155,1165
1105 S1=S1+PR*Q:GOTO1175
1115 S2=S2+PR*Q:GOTO1175
1125 S3=S3+PR*Q:GOTO1175
1135 S4=S4+PR*Q:GOTO1175
1145 S5=S5+PR*Q:GOTO1175
1155 S6=S6+PR*Q:GOTO1175
1165 S7=S7+PR*Q:GOTO1175
1175 PRINT Z$
1185 PRINT"PRESS [ENTER] TO CONT
INUE";:INPUT C
1195 GOTO 1205
1205 CLS:TS=S1+S2+S3+S4+S5+S6+S7
1206 PRINT@10,"HIT [ENTER]"
1207 PRINT@37,"IF SALE IS NOT CO
MPLETE"
1215 PRINT:PRINT:PRINT"TOTAL THI
S SALE" TS
1225 PRINT"AMOUNT TENDERED";:INP
UT AT:IF AT=0THEN935
1235 CLS
1245 PRINT@34,"TOTAL THIS SALE"
1255 PRINT@98,"AMOUNT TENDERED"
1265 AC=AT-TS
1275 PRINT@161,"AMOUNT OF CHANGE
"
1285 PRINT@52,USING"###.##";TS
1295 PRINT@116,USING"###.##";AT
1305 PRINT@149,STRING$(6,"-")
1315 PRINT@181,USING"##.##";AC
1316 GOTO 1355
1325 S1=0:S2=0:S3=0:S4=0:S5=0:S6
=0:S7=0
1335 PRINT:PRINT:PRINT"PRESS ENT
ER TO CONTINUE";:INPUT F
1345 GOTO 935
1355 L1=L1+S1
1365 L2=L2+S2
1375 L3=L3+S3
1385 L4=L4+S4
1395 L5=L5+S5
1405 L6=L6+S6
1415 L7=L7+S7:GOTO 1325
1425 CLS:PRINT"TOTALS FOR THE DA
Y"
1435 PRINT
1445 PRINTN$(1)" =";:PRINT@81,US
ING"###.##";L1
1455 PRINTN$(2)" =";:PRINT@113,U
SING"###.##";L2
1465 PRINTN$(3)" =";:PRINT@145,U
SING"###.##";L3
1475 PRINTN$(4)" =";:PRINT@177,U
SING"###.##";L4
1485 PRINTN$(5)" =";:PRINT@209,U
SING"###.##";L5
1495 PRINTN$(6)" =";:PRINT@241,U
SING"###.##";L6
1505 PRINTN$(7)" =";:PRINT@273,U
SING"###.##";L7
1514 TS=L1+L2+L3+L4+L5+L6+L7
1515 PRINT:PRINT"TODAYS TOTAL SA
LES =";:PRINTUSING"$###.##";TS
1525 PRINT"PRESS ENTER TO CONTIN
UE";:INPUT C
1535 CLS:PRINT"DO YOU WANT TO CH
ANGE MESSAGE?  [Y/N]"
1545 PRINT:PRINT:PRINT"TYPE [ R
] TO RERUN OLD MESSAGE":INPUT MZ
$
1555 IF MZ$="Y"THEN 15ELSEIFMZ$=
"R"THEN65ELSE935
1565 S1=0:S2=0:S3=0:S4=0:S5=0:S6
=0:S7=0
1575 GOTO ~~65~~ 935
```

1575 GOTO 935

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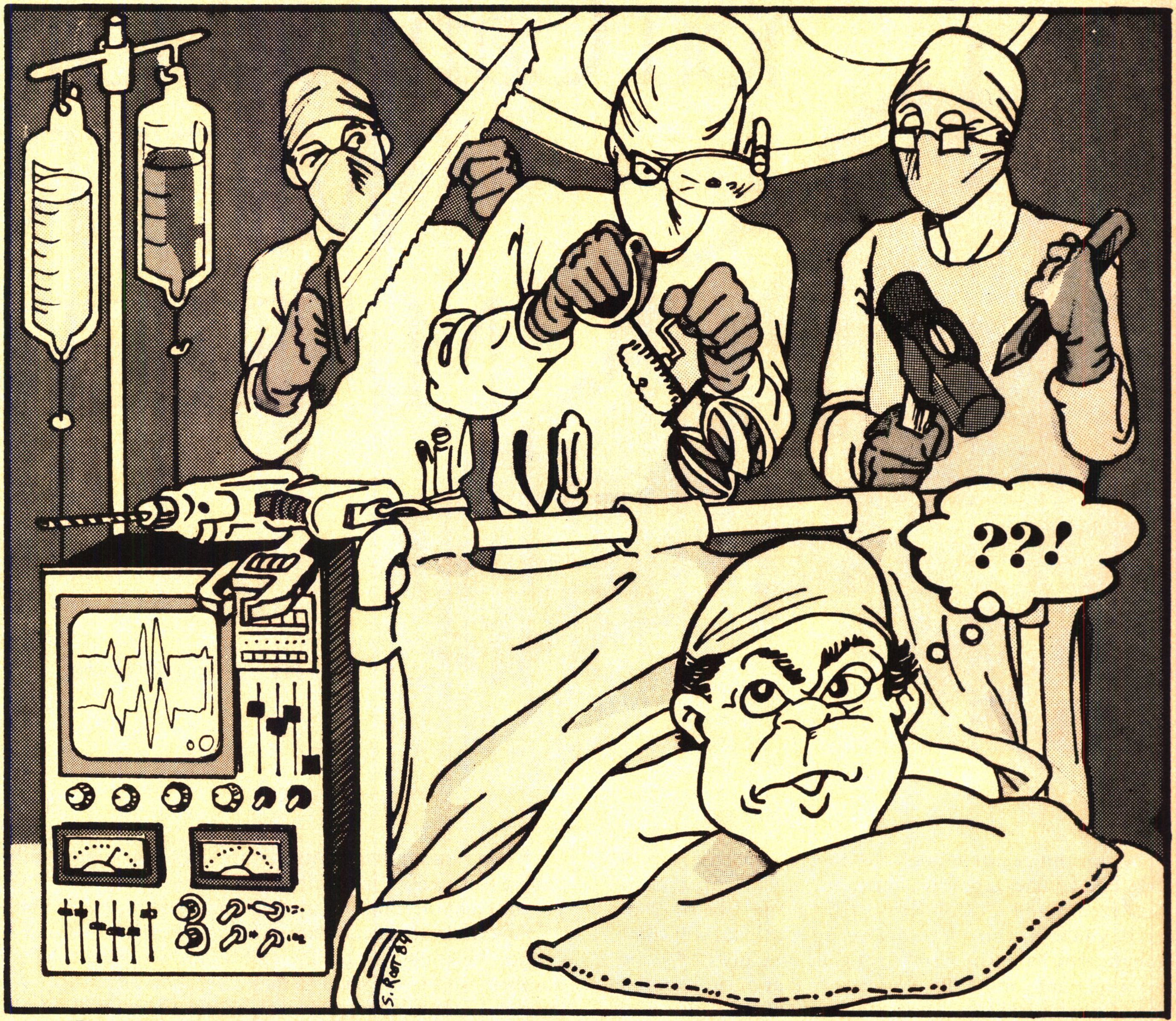

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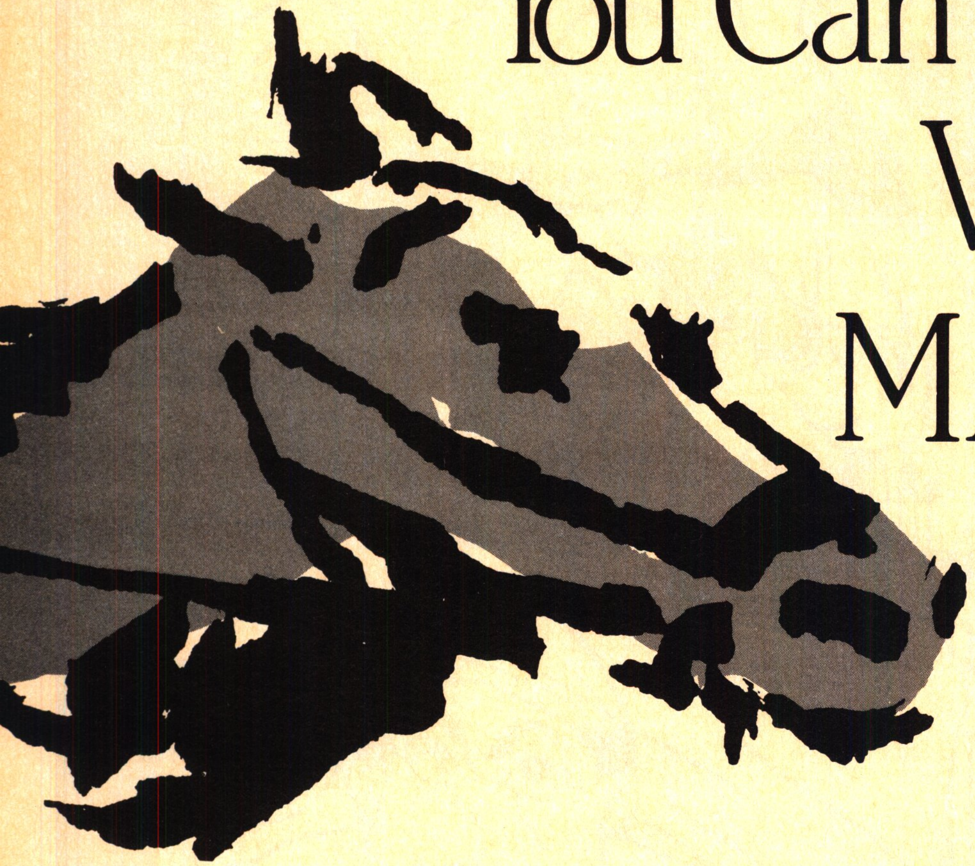
# You Can Bet On WAGER MASTER



**By Leonard Hyre**

Some things just go together: Love and marriage, milk and cookies, apple pie and mom, and of course, horse racing and CoCo! Horse racing and CoCo? Well, maybe you think this is a bit of an exaggeration. I will admit though, that from the day I brought home my CoCo, the pair were on my mind. I had to believe that my unrelenting love of racing and the unwavering logic of the CoCo were just intended to get together. The results were *Harness Handicapper* and *Thoroughbred Handicapper*. But the CoCo has other possibilities also. Thus *Wager Master* came about.

Competent handicapping is only one-half of the formula for successful wagering at the races. It has been my expe-tired from really trying to win, this can be difficult. Several of the features of *Wager Master* are designed to assist in setting up prerace selections of these types of bets, using the probable winner as the key ingredient.

---

*(Leonard Hyre, author of* Thoroughbred Handicapper *and* Harness Handicapper, *both marketed through Federal Hill Software, is also the author of several programs which have appeared previously in* the Rainbow. *As well as being a CoCo enthusiast, Mr. Hyre is a claims representative for the Social Security Administration.)*

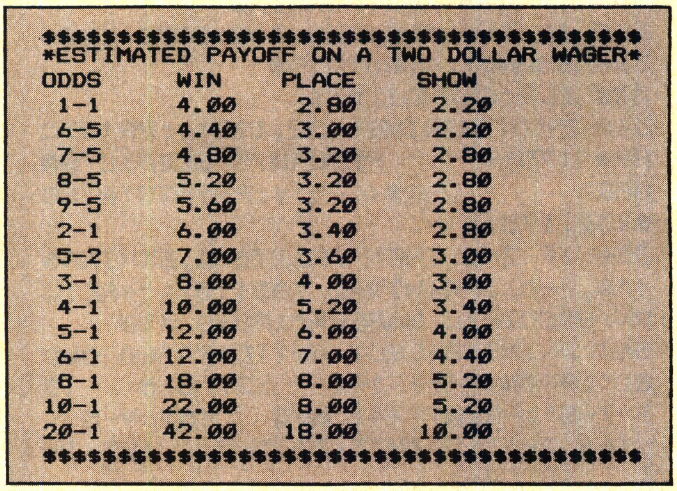
Upon running *Wager Master*, the user is prompted with a menu from which one of eight options can be selected. Seven of the eight offer printer options and six require user input. To maximize user audience, I have kept *Wager Master* to rience to know several incredibly knowledgeable handicappers who never seem to make a reasonable profit. The reason — money management! A little planning, especially before you even arrive at the track, is a big start on financial success to go with the handicapping.

*Wager Master* is a tool to aid in that money management need. By carefully weighing the probable odds on your selections and experimenting with them, you can better determine the chances of a reasonable return on an investment. It also satisfies that "tinkering" nature of racing fans who like to doodle around with odds and the like.

While I personally prefer win or win/place wagering, I will admit to that occasional weakness of a double, exacta or triple bet. Though not the soundest of ideas in even the best of conditions, the urge to drop a bit on these "exotic" bets is virtually impossible to resist. I believe the weakness of this type of wager is that the handicapper must pick not only the winner, but also is betting on who will lose and by how much! Since second- and third-place finishers are sometimes horses who got there simply by passing horses that were within 16K parameters and all print routines are done using *TAB* and *PRINT USING* commands so as to be compatible with all printers. Also, the printouts are limited to a 40-column printer width. For those with no printer, all information is displayed on the screen first.

Lines 190-320:

Standard Payoffs (option 1) requires no user input and is simply a table of payoffs at various odds. The win table is, of course, easy to determine. The figures used for place and show columns are estimates based on average payoffs for the odds shown and should not be considered as necessarily accurate. The betting public can do strange things. The table may be printed out for handy reference at the track.



```
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
*ESTIMATED PAYOFF ON A TWO DOLLAR WAGER*
ODDS      WIN      PLACE      SHOW
 1-1      4.00      2.80      2.20
 6-5      4.40      3.00      2.20
 7-5      4.80      3.20      2.80
 8-5      5.20      3.20      2.80
 9-5      5.60      3.20      2.80
 2-1      6.00      3.40      2.80
 5-2      7.00      3.60      3.00
 3-1      8.00      4.00      3.00
 4-1     10.00      5.20      3.40
 5-1     12.00      6.00      4.00
 6-1     12.00      7.00      4.40
 8-1     18.00      8.00      5.20
10-1     22.00      8.00      5.20
20-1     42.00     18.00     10.00
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
```

Lines 330-600:

A Return Per Specific Wager (option 2) section is presented for the fun of the "what if" in us. Just input anticipated odds, the amounts to bet on win, place and show, and instantly be presented with the fortune you anticipate will come rolling in. Print it out if you wish.

Lines 610-810:

Option 3 is Wagering Record Keeper, a truly handy way of keeping your racing records. I find this infinitely better than a huge stack of accumulating Racing Forms and harness programs. With place, date, name and results for the entire day on a handy sheet, you can quickly see how you have done, now and in the past, and make adjustments accordingly to your style.

Lines 820-1050:

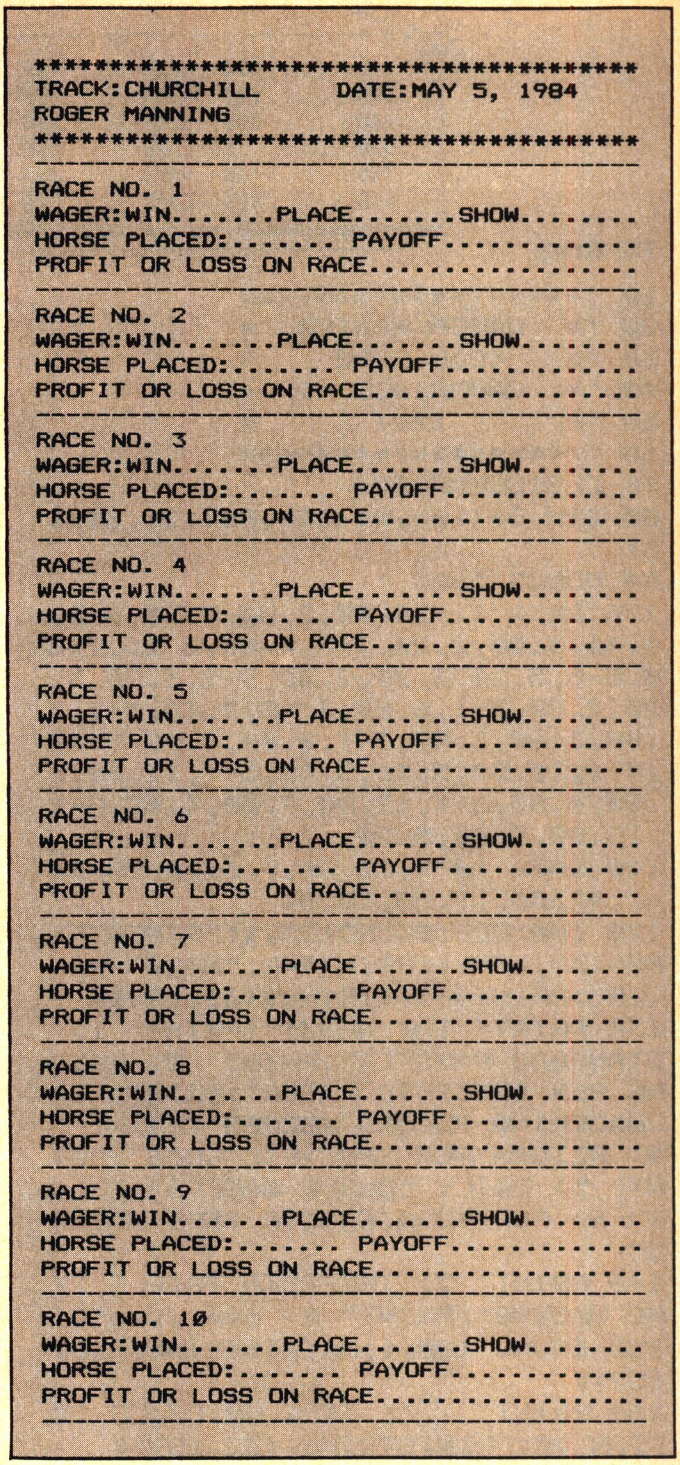
Play around with Return Per Specific Odds (option 4), requiring limited user input and returning the amount a variety of different size win wagers would return at given odds. Printer option available here also.

Lines 1060-1540:

Options 5, 6 and 7 offer the most likely combinations to win an "exotic" wager based on your best handicapping information. All three offer "hedge" bets as well and can be routed to the printer.

Lines 1550-1580:

A general statement is offered as an Overview (option 8). This is to remind would-be users of the fact that the program does not do the handicapping and that the place and show charts are strictly estimates!



```
****************************************
TRACK:CHURCHILL      DATE:MAY 5, 1984
ROGER MANNING
****************************************
----------------------------------------
RACE NO. 1
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 2
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 3
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 4
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 5
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 6
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 7
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 8
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 9
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
RACE NO. 10
WAGER:WIN.......PLACE.......SHOW........
HORSE PLACED:....... PAYOFF.............
PROFIT OR LOSS ON RACE..................
----------------------------------------
```

*Wager Master* is both serious and fun for the casual or regular horse racing fan alike. I hope you will agree.

Programming structure is kept relatively simple. If you haven't been making much use of the powerful *PRINT USING* command, a review of the program might be useful. The program is broken down into eight distinct subroutines, one for each option, accessed by a single *ON-x- GOTO* line. *DATA* statements are read in as four strings representing odds, win payoff, place payoff and show payoff. These are then manipulated as needed by each of the subroutines to obtain desired results.

If you don't want to type in the program, I will be glad to send you a copy of tape for $4.50. Just send check to: L. Hyre, P.O. Box 403, Cambridge, MD 21613.

|  |  |  |  |
|---|---|---|---|
| 140 | 174 | 1020 | 141 |
| 280 | 237 | 1160 | 25 |
| 440 | 130 | 1260 | 126 |
| 620 | 6 | 1370 | 136 |
| 760 | 35 | 1470 | 143 |
| 910 | 223 | END | 29 |

The listing:

```
10 '*****************
20 '*  WAGER MASTER  *
30 '*   <C>L.HYRE    *
40 '*  CAMBRIDGE MD  *
50 '*      1/84      *
60 '*****************
70 CLS:CLEAR1000
80 DIM O$(15),W$(15),P$(15),S$(1
5)
90 GOSUB 1600
100 DATA 1-1,4.00,2.80,2.20,6-5,
4.40,3.00,2.20,7-5,4.80,3.20,2.8
0,8-5,5.20,3.20,2.80,9-5,5.60,3.
20,2.80,2-1,6.00,3.40,2.80,5-2,7
.00,3.60,3.00,3-1,8.00,4.00,3.00
,4-1,10.00,5.20,3.40,5-1,12.00,6
.00,4.00,6-1,12.00,7.00,4.40,8-1
,18.00,8.00,5.20
110 DATA 10-1,22.00,8.00,5.20,20
-1,42.00,18.00,10.00
120 Z=0:CLS:SOUND125,1:PRINTSTRI
NG$(33,159);:PRINT@42,"WAGER MAS
TER":PRINT@63,STRING$(33,159);
130 PRINT" THE MENU:":PRINT" 1>
STANDARD PAYOFFS":PRINT" 2> RETU
RN PER SPECIFIC WAGER":PRINT" 3>
 WAGERING RECORD KEEPER":PRINT"
4> RETURN PER SPECIFIC ODDS":PRI
NT" 5> DAILY DOUBLE WAGERS":PRIN
T" 6> PERFECTA,EXACTA TYPE WAGER
S"
140 PRINT" 7> TRIFECTA,TRIPLE TY
PE WAGERS":PRINT" 8> overview"
150 SOUND 100,1:PRINTSTRING$(32,
159);
160 PRINT"     < TYPE NO.OF SELEC
TION >":PRINTSTRING$(32,159);
170 AN$=INKEY$:IFAN$=""THEN 170
180 ON VAL(AN$) GOTO 190,330,610
,820,1080,1210,1360,1550
190 CLS:SOUND 125,1:IF Z=2 THEN
PRINT#-Z,STRING$(40,"$"):PRINT#-
Z,"*ESTIMATED PAYOFF ON A TWO DO
LLAR WAGER*
200 PRINT#-Z,"ODDS     WIN    PL
ACE    SHOW"
210 FORX=1TO14:IF LEN(O$(X))=3 T
HEN O$(X)=" "+O$(X)
220 IF LEN(W$(X))=4 THEN W$(X)="
 "+W$(X)
230 IF LEN(P$(X))=4 THEN P$(X)="
 "+P$(X)
240 IF LEN(S$(X))=4 THEN S$(X)="
 "+S$(X)
250 PLAY"T255V31O4D":PRINT#-Z,TA
B(0);O$(X);TAB(8);W$(X);TAB(16);
P$(X);TAB(25);S$(X)
260 NEXT
270 IF Z=2 THEN PRINT#-Z,STRING$
(40,"$"):PRINT#-2:PRINT#-2:GOTO1
20
280 PRINT"<m>ENU    <p>RINTER";
290 AN$=INKEY$:IFAN$=""THEN290
300 IF AN$="M"THEN 120
310 IF AN$="P"THEN Z=2:GOTO 190
320 SOUND1,4:GOTO290
330 CLS:SOUND125,1
340 PRINTSTRING$(32,175);:PRINTC
HR$(175)+"     RETURN/SPECIFIC WA
GER      "+CHR$(175);:PRINTSTRING
$(32,175);
350 IF Z=2 THEN PRINT#-2,STRING$
(40,"-"):PRINT#-2,TAB(10);"*RETU
RN/SPECIFIC WAGER*":GOTO 410
360 PRINT"SELECT ANTICIPATED ODD
S:":PRINT"(1) 1-1    (2) 6-5    (3
) 7-5":PRINT"(4) 8-5    (5) 9-5
 (6) 2-1":PRINT"(7) 5-2    (8) 3-
1    (9) 4-1
370 PRINT"(10)5-1    (11)6-1    (1
2)8-1":PRINT"(13)10-1   (14)20-1"
380 INPUT OD$:IF VAL(OD$)>14 THE
N 380 ELSE X=VAL(OD$)
390 PLAY"V31T100O4EO5E":PRINT "O
DDS=";O$(X)
400 INPUT"HOW MUCH TO WIN    ";WM
:INPUT"HOW MUCH TO PLACE ";PM:IN
PUT"HOW MUCH TO SHOW  ";SM
410 CLS:PRINT"         RETURN FOR W
AGER"
420 IFZ=1THENPRINTSTRING$(32,159
);
430 PRINT#-Z,"FOR A HORSE AT  ";
O$(X);" ODDS"
440 PRINT#-Z,"TOTAL WAGER OF";:P
RINT#-Z,USING"$#######.##";WM+PM+
SM
450 PRINT#-Z,"YOUR PAYOFF WOULD
BE:"
460 W=VAL(W$(X))/2:P=VAL(P$(X))/
2:S=VAL(S$(X))/2
470 PRINT#-Z,USING"WIN    $#######
.##";WM*W:PLAY"V31T100O4EO5E"
480 PRINT#-Z,USING"PLACE $#######
.##";PM*P:PLAY"O4EO5E"
490 PRINT#-Z,USING"SHOW   $#######
.##";SM*S:PLAY"O4EO5E"
500 PRINT#-Z,STRING$(16,"-")
510 PRINT#-Z,USING"TOTAL $#######
.##";(WM*W)+(PM*P)+(SM*S):PLAY"O
4EO5E"
```

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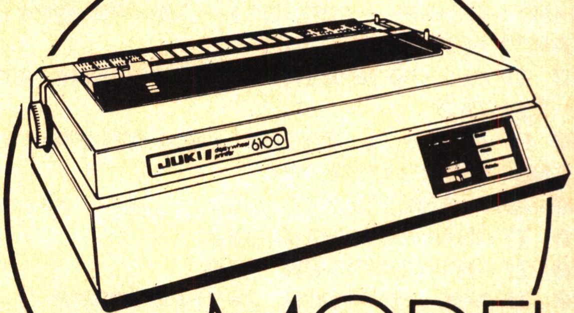

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```
520 PRINT#-Z,USING"LESS  $#######
.##";WM+PM+SM:PLAY"O4EO5E"
530 PRINT#-Z,STRING$(16,"-"):PRI
NT#-Z,USING"PROFIT ######.##";((
WM*W)+(PM*P)+(SM*S))-(WM+PM+SM):
PLAY"T10O5CG"
540 IFZ=2THENPRINT#-2,STRING$(40
,"-"):Z=0
550 PRINT#-Z::PRINT"<a>NOTHER  <
m>ENU  <p>RINTER";
560 AN$=INKEY$:IFAN$=""THEN 560
570 IFAN$="A"THEN 330
580 IFAN$="M"THEN 120
590 IFAN$="P"THEN Z=2:GOTO350
600 SOUND1,4:GOTO 560
610 CLS:PRINTSTRING$(33,159);:PR
INT@38,"WAGERING RECORD KEEPER":
PRINT@63,STRING$(33,159);
620 PRINT"IS PRINTER ON?":SOUND1
25,1:SOUND155,1
630 A$=INKEY$:IFA$=""THEN 630
640 IFA$<>"Y"THEN SOUND 1,1:GOTO
 630
650 PLAY"V31T50O3DO4DO5D"
660 PRINT"MAKE SURE PAPER IS ADV
ANCED TO  PRINT HEAD!"
670 PRINT:INPUT"RACECOURSE NAME"
;RC$:PLAY"T100V31O4EO5E"
680 INPUT"TODAYS DATE:";DT$:PLAY
"O4EO5E"
690 INPUT"YOUR NAME:";NM$:PLAY"O
4EO5E"
700 PRINT:PRINT:PRINT"**********
now"+CHR$(128)+"printing********
**"
710 PRINT#-2,STRING$(40,"*"):PRI
NT#-2,"TRACK:";RC$;TAB(20);"DATE
:"DT$:PRINT#-2,NM$:PRINT#-2,STRI
NG$(40,"*")
720 FORR=1TO10
730 PRINT#-2,STRING$(40,"-"):PRI
NT#-2,"RACE NO.";R
740 PRINT#-2,"WAGER:WIN.......PL
ACE.......SHOW........"
750 PRINT#-2,"HORSE PLACED:.....
..";TAB(21);"PAYOFF.............
"
760 PRINT#-2,"PROFIT OR LOSS ON
RACE.................."
770 NEXT R
780 PRINT#-2,STRING$(40,"-"):PRI
NT"DONE-"
790 PRINT"PRESS <1>ANOTHER  <2>M
ENU
800 A$=INKEY$:IFA$=""THEN 800
810 IF A$="1"THEN 610 ELSE IF A$
="2"THEN 120 ELSE SOUND1,1:GOTO
800
820 CLS:SOUND125,1
830 PRINTSTRING$(32,175);:PRINTC
HR$(175)+"    RETURN / SPECIFIC
ODDS    "+CHR$(175);:PRINTSTRING
$(32,175);STRING$(32,195);
840 PRINT"SELECT ODDS:":PRINT"(1
) 1-1   (2) 6-5   (3) 7-5":PRINT
"(4) 8-5   (5) 9-5   (6) 2-1":PR
INT"(7) 5-2   (8) 3-1   (9) 4-1"
850 PRINT"(10)5-1   (11)6-1   (1
2)8-1":PRINT"(13)10-1   (14)20-1
"
860 INPUTOD$:IFVAL(OD$)>14 THEN
860 ELSE X=VAL(OD$)
870 PLAY"V31T100O4EO5E":IFZ=0 TH
EN PRINT"ODDS= ";O$(X)
880 SOUND125,1:SOUND155,1:FORTI=
1TO500:NEXTTI
890 CLS:IF Z=2 THEN PRINT#-Z,STR
ING$(40,"-"):PRINT#-Z,"        *R
ETURN PER SPECIFIC ODDS*":GOTO 9
10
900 CLS:PRINTSTRING$(33,159);:PR
INT"***RETURN PER SPECIFIC ODDS*
**";:PRINTSTRING$(33,159);STRING
$(32,195);
910 PRINT#-Z,"<ODDS=";O$(X);">
  *WIN ONLY*
920 MU=VAL(W$(X))/2
930 PRINT#-Z:PLAY"T100V31O4EO5E"
:PRINT#-Z,"WAGER $ 2.00   PAYOFF
:";:PRINT#-Z,USING"$####.##";2*M
U
940 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $ 4.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";4*MU
950 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $ 5.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";5*MU
960 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $ 6.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";6*MU
970 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $10.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";10*MU
980 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $20.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";20*MU
990 PLAY"O4EO5E":PRINT#-Z,"WAGER
 $50.00   PAYOFF:";:PRINT#-Z,USI
NG"$####.##";50*MU
1000 IF Z=2 THEN PRINT#-Z,STRING
$(40,"-"):PRINT#-Z:PRINT#-Z:GOTO
120
1010 PRINT:PRINT"<a>NOTHER  <p>R
INTER   <m>ENU";
1020 AN$=INKEY$:IFAN$=""THEN 102
0
1030 IFAN$="A"THEN 820
1040 IFAN$="P"THEN Z=2:GOTO870
1050 IF AN$="M"THEN 120
1060 SOUND1,4:GOTO 1020
```

```
1070 GOTO 1070
1080 CLS:PRINT@44,"printing":PLA
Y"T100V3103C04D05E":PRINTSTRING$
(33,159);"* THE DAILY DOUBLE SEL
ECTION *";STRING$(33,159);:PRINT
STRING$(32,195);
1090 PRINT:PLAY"T100V3104E05E":I
NPUT" TOP CHOICE-1ST RACE:";T1:P
LAY"04E05E":INPUT" 2ND CHOICE-1S
T RACE:";T2:PLAY"04E05E":INPUT"
TOP CHOICE-2ND RACE:";T3:PLAY"04
E05E":INPUT" 2ND CHOICE-2ND RACE
:";T4
1100 CLS:PLAY"03C04D05E":PRINTST
RING$(33,159);:PRINT"* THE DAILY
 DOUBLE SELECTION *";STRING$(33,
159);STRING$(32,195)
1110 PRINT:PRINT"KEY BET:"T1;"-"
;T3
1120 PRINT"ALSO:    ";T1;"-";T4;"
  **  ";T2;"-";T3
1130 PRINT:PRINTSTRING$(32,175);
:PLAY"03E04E03E":PRINT"      POSS
IBLE HEDGE:"T2;"-";T4:PRINTSTRIN
G$(32,175);:PRINT:PRINT
1140 PRINT"<m>ENU      <p>RINTER"
;
1150 AN$=INKEY$:IFAN$=""THEN 115
0
1160 IF AN$="M"THEN 120
1170 IFAN$="P"THEN 1180 ELSE SOU
ND1,1:GOTO 1150
1180 CLS:PRINT@44,"PRINTING":PRI
NT#-2:PRINT#-2,STRING$(40,"-"):P
RINT#-2,TAB(6);"*DAILY DOUBLE SE
LECTION*":PRINT#-2,"KEY BET:"T1;
"-";T3;"     Also:";T1;"-";T4;"an
d";T2;"-";T3
1190 PRINT#-2,"POSSIBLE HEDGE BE
T:";T2;"-";T3:PRINT#-2,STRING$(4
0,"-"):PRINT#-2,STRING$(40,"-"):
PRINT#-2
1200 PRINT@37,"PRINT ACTION FINI
SHED":SOUND125,1:SOUND175,1:FORT
I=1TO300:NEXT:GOTO120
1210 CLS:PLAY"T100V3103C04D05E":
PRINTSTRING$(33,159)+" PERFECTA-
EXACTA COMBINATIONS ";+STRING$(3
3,159);:PRINTSTRING$(32,195);
1220 PLAY"04E05E":INPUT" ENTER T
OP CHOICE NO.";T1
1230 PLAY"04E05E":INPUT" SECOND
CHOICE";T2:PLAY"04E05E":INPUT" T
HIRD CHOICE";T3
1240 CLS:PLAY"03C04D05E":PRINTST
RING$(33,175)+STRING$(9,128)+"co
mbinations"+STRING$(9,128)+STRIN
G$(33,175);
```

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```
1250 PRINTSTRING$(32,195);:PRINT
" PLAY:  ";T1;"-";T2;" ** ";T1;"
-";T3
1260 PRINT"             ";T2;"-";T1;"
 ** ";T3;"-";T1"
1270 PRINT:PRINTSTRING$(32,159);
:PRINT"IF TOP CHOICE IS 5-1 OR G
REATER CONSIDER PLAYING ";T1;"-
all":PRINTSTRING$(32,159);
1280 PRINT:PRINT:PRINT" <m>ENU
     <p>RINTER"
1290 AN$=INKEY$:IFAN$=""THEN 129
0
1300 IF AN$="M"THEN 120 ELSE IF
AN$="P"THEN 1310 ELSE SOUND1,4:G
OTO 1290
1310 SOUND 125,1:SOUND125,1:INPU
T"INPUT RACE NO.";RN:PLAY"04E05E
;":PRINT#-2,STRING$(40,"-"):PRIN
T#-2,"      *PERFECTA/EXACTA WAGE
RING*"
1320 CLS:PRINT@44,"PRINTING":SOU
ND155,1:SOUND125,1:PRINT#-2,TAB(
12);"RACE NO.";RN:PRINT#-2,"Comb
inations To Play:";T1;"-";T2;" *
* ";T1;"-";T3:PRINT#-2,STRING$(2
1," ");T2;"-";T1;" ** ";T3;"-";T
1
1330 PRINT#-2,"IF CHOICE IS 5-1
OR UP CONSIDER";T1;"-All"
1340 PRINT#-2,STRING$(40,"-"):PR
INT#-2:PRINT#-2
1350 PRINT@40,"printing complete
":SOUND 125,1:SOUND155,1:FORTI=1
TO600:NEXT:GOTO 120
1360 CLS:PLAY"T100V3103C04D05E":
PRINTSTRING$(33,159);:PRINT@36,"
 BIG TRIPLE SELECTIONS ";:PRINT@
63,STRING$(33,159);:PRINTSTRING$
(32,128);
1370 PRINT" ENTER HORSE NUMBERS"
:INPUT" TOP SELECTION:";T1:PLAY"
04E05E"
1380 INPUT"SECOND SELECTION";T2:
PLAY"04E05E"
1390 INPUT"THIRD  SELECTION";T3:
PLAY"04E05E"
1400 INPUT"FOURTH SELECTION";T4:
PLAY"04E05E"
1410 CLS:PLAY"03C04D05E":PRINTST
RING$(38,255)+" TRIPLE  SELECTIO
NS "+STRING$(38,255)+STRING$(32,
195);:PRINT:PLAY"04E05E":PRINT"P
LAY ";T1;"-";T2;"-";T3;:PLAY"04E
05E":PRINT"        ";T1;"-";T2;"-";
T4;
1420 PLAY"04E05E":PRINT"        ";T
1;"-";T3;"-";T2;:PLAY"04E05E":PR
INT"      ";T1;"-";T3;"-";T4;:PLA
Y"04E05E":PRINT"        ";T1;"-";T4
```

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```
;"-";T2;:PLAY"O4EO5E":PRINT"
 ";T1;"-";T4;"-";T3
1430 PRINT:PRINTSTRING$(33,128)+
"  THE HEDGE BOX    ";T1;"-";T2;"
-";T3;" ";STRING$(33,128);
1440 IF Z=2 THEN 120
1450 PRINT"<m>ENU       <p>RINTER"
;
1460 AN$=INKEY$:IFAN$=""THEN 146
0
1470 IF AN$="M"THEN 120 ELSE IF
AN$="P"THEN 1480 ELSE SOUND1,4:G
OTO 1460
1480 CLS:SOUND125,1:SOUND 155,1:
PRINT@44,"PRINTING":PRINT#-2,STR
ING$(40,"-"):PRINT#-2,STRING$(11
," ");"TRIPLE  SELECTION"
1490 PRINT#-2,TAB(9)"PLAY:  ";T1
;"-";T2;"-";T3:PRINT#-2,TAB(16);
T1;"-";T2;"-";T4
1500 PRINT#-2,TAB(16);T1;"-";T3;
"-";T2:PRINT#-2,TAB(16);T1;"-";T
3;"-";T4
1510 PRINT#-2,TAB(16);T1;"-";T4;
"-";T2:PRINT#-2,TAB(16);T1;"-";T
4;"-";T3
1520 PRINT#-2:PRINT#-2,"**The He
dge Box:";T1;"-";T2;"-";T3
1530 PRINT#-2,STRING$(40,"-")
1540 GOTO 120
1550 CLS:PRINTCHR$(193)+STRING$(
30,195)+CHR$(194);:PRINTCHR$(197
)+"*** WAGER MASTER  OVERVIEW **
*"+CHR$(202);:PRINTCHR$(196)+STR
ING$(30,204)+CHR$(200);:PRINTSTR
ING$(32,147);:PLAY"T100V3104C04D
05E"
1560 PRINT"THIS PROGRAM IS PRESE
NTED AS  ANAID FOR YOUR HANDICAP
PING. IT ISNOT DESIGNED TO DO  H
ANDICAPPINGFOR YOU! THIS IS FOR
THE BETTOR.";
1570 PRINTSTRING$(32,255);:PRINT
"NOTE** ALL 'PLACE' & 'SHOW' ODD
S";:PRINT"ARE strictly ESTIMATES
 AND OFTENFLUCTUATE WITH THE MUT
UAL POOL. ";:PRINTSTRING$(32,255
);:PRINT:PRINT"< PRESS ANY KEY F
OR MENU >";
1580 AN$=INKEY$:IFAN$=""THEN 158
0 ELSE 120
1590 GOTO 1590
1600 FORX=1 TO 14
1610 READ O$(X),W$(X),P$(X),S$(X
)
1620 NEXT X
1630 RESTORE:RETURN
1640 RETURN
```

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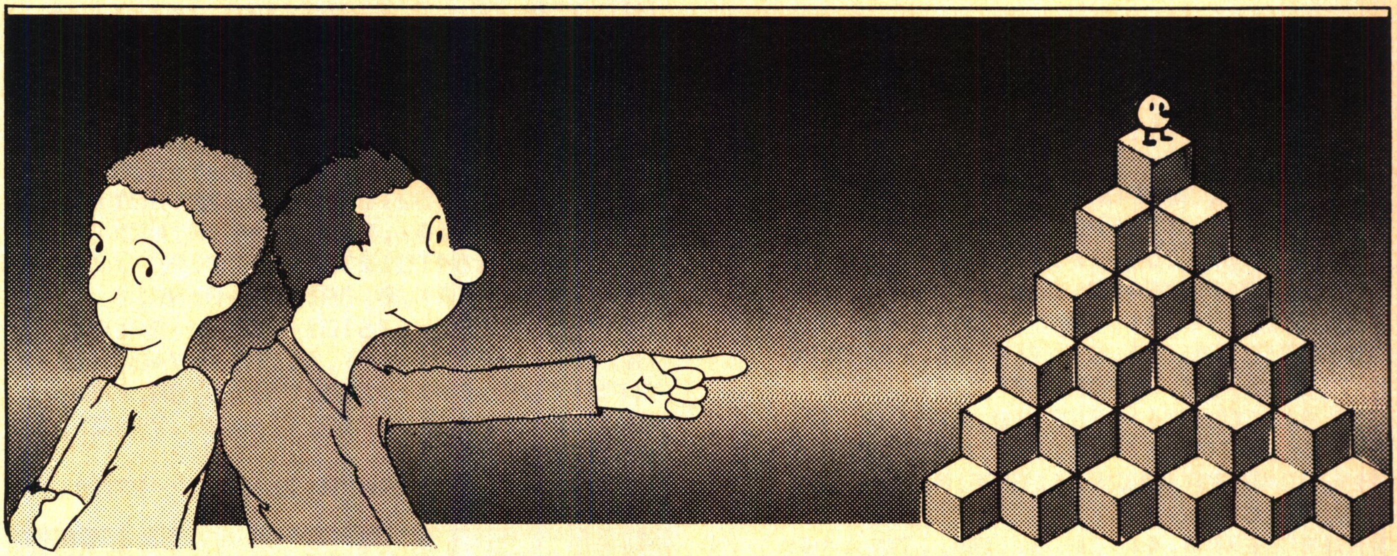
# We Want Our Q-NERD!

### By Jerry D. Forsha



Q-*Nerd* is my version of Q-Bert for 16K Extended Color BASIC. To load *Q-Nerd* turn the computer off and on or *POKE 113,3* [ENTER] and press the [RESET] button. Load *Q-Nerd* and *RUN*.

*Q-Nerd* uses the right joystick for movement. To move *Q-Nerd* down to the left, move joystick down and to the left. Right, up and down directions, also move appropriately with the joystick.

As *Q-Nerd* moves, the blocks change color from green to blue, but you must change all blocks to the same color before the colors change. You start with three men. As you move on the blocks, points are scored. On the first color each block is worth 10 points and each time you change colors the points increase by 10. Extra men are given points of 4,000 for the first one, 8,000 for the next one, 16,000 for the next one, etc., to a total of five extra men. If you fall off or the snake and/or ball catches you then your points will be updated.

**Line Description**

Line 0 sets up dims and variables.

Line 1 disables [BREAK] key, (BASIC runs 30 percent faster).

Lines 2-17 set up game: draw men, blocks, wait to start game.

Lines 18-25 read joysticks; check each block to see if all are set to the same color; put ball on screen; check platforms; check score for extra men: put snake on screen; go back to read joysticks.

Lines 26-27 put ball on screen; check to see if ball and man are in same position.

Lines 28-29 move man down to the left; check to see if man falls off of the edge.

Lines 30-31 move man down to the right; check to see if man falls off.

Lines 32-33 move man up to the right; check to see if man falls off.

Lines 34-35 move man up to the left; check to see if man falls off.

Lines 36-37 check to see if platform is there; move man and platform; move snake (if on board).

Lines 38-39 check to see if right platform is there; move man and platform; move snake (if on board).

Lines 40-49 check to see if snake is on board; make the snake chase the man; if man on platform, kill snake over the edge: check to see if snake and man are in the same position.

Lines 50-51 draw man going over the edge; update and draw the score: check to see if this was the last man.

Line 52 if ball or snake landed on man, draw saying and play "rats."

Lines 53-55 end of game: draw score: set up variables for a new game.

---

*(Jerry Forsha is a retail sales auditor and free-lance computer programmer specializing in business programs. This is his first computer game.)*

| | |
|---|---|
| 4 | 229 |
| 11 | 190 |
| 16 | 212 |
| 24 | 10 |
| 32 | 233 |
| 39 | 41 |
| 50 | 211 |
| END | 16 |

**The listing:**

```
0 CLS:PMODE3,1:PCLS:CLEAR0:CLEAR
1500:DIMRA(1),LA(1),R(1),RX(1),B
(12),P(2),MR(6),ML(6),S(3),SX(3)
,SA(24),N$(9):Y2=56:C=3:CS=1:SS=
4000:M=1:Q=2
1 POKE248,50:POKE249,98:POKE250,
28:POKE251,175:POKE252,126:POKE2
53,173:POKE254,165:POKE410,126:P
OKE411,0:POKE412,248
2 CIRCLE(10,4),10,3,.50,.15,.85:
COLOR3:LINE(14,0)-(14,6),PSET:PA
INT(10,6),2,3:PSET(7,2,4):PSET(1
1,2,4):COLOR4:LINE(10,4)-(20,4),
PSET:LINE(7,6)-(11,6),PSET:DRAW"
BM4,8D4R2BR4NU2R2":GET(0,0)-(20,
12),MR,G
3 CIRCLE(50,4),10,3,.50,.70,.40:
COLOR3:LINE(46,0)-(46,6),PSET:PA
INT(50,6),2,3:PSET(54,2,4):PSET(
50,2,4):COLOR4:LINE(50,6)-(54,6)
,PSET:LINE(40,4)-(50,4),PSET:DRA
W"BM56,8D4L2BL4NU2L2":GET(40,0)-
(60,12),ML,G:LINE(40,0)-(60,12),
PRESET,BF
4 CIRCLE(180,20),5,4,.6:PSET(180
,20,4):GET(176,18)-(186,22),R,G:
LINE(176,18)-(186,22),PRESET,BF
5 DRAW"C4BM200,4NE2R12NH2":PSET(
200,5):PSET(202,6):PSET(212,5):P
SET(210,6):PSET(198,4):PSET(214,
4):GET(204,2)-(214,6),RA,G:GET(1
98,2)-(208,6),LA,G:LINE(198,2)-(
214,6),PRESET,BF
6 DRAW"C4BM200,6RFDGLHRFDGLHRFDG
LHRFDGLHR4F2DL4":GET(194,6)-(204
,18),S,G:LINE(194,6)-(204,18),PR
ESET,BF
7 CIRCLE(128,20),30,4,.30:DRAW"S
6BM106,17ND4R4D2L2F2BR4E4F2NL2F2
BR4U4NL2R2BR4NR2D2R2D2L2":GET(10
0,12)-(156,28),SA,G:LINE(98,12)-
(158,28),PRESET,BF
8 FORR=0TO9:READN$(R):NEXT:DATAB
R2D8R4U8NL4BR2,BR4NG2D8NR2L2BU8B
R6,BR3R2F1DG4D2R4BU8BR2,BR2R4D4N
L2D4NL4BU8BR2,BR2D4R4NU4D4BU8BR2
,BR2NR4D4R4D4NL4BU8BR2,BR2NR4D8R
4U4NL4BU4BR2
9 DATABR2R4D2G4D2BU8BR6,BR2NR4D4
NR4D4R4U8BR2,BR2NR4D4R4NU4D4BU8B
R2
10 PMODE1,1:PCLS:DRAW"S4C2BM128,
20R20F12L20H12D16F12NU16R20U16C3
BM66,42R10F6L10H6D4F6NU4R10U4":P
AINT(72,46),2,3:PSET(68,46,2):PS
ET(70,48,2):PAINT(74,50),2,3:GET
(66,42)-(84,52),P,G:PUT(192,88)-
(210,98),P,OR:PR=0:PL=0
11 PMODE3,1:PAINT(130,14),2,2:PA
INT(158,20),2,2:GET(128,10)-(160
,24),B,G:Y=18:FORX=108TO22STEP-2
0:PUT(X,Y)-(X+32,Y+14),B,OR:Y=Y+
8:NEXT
12 Y=24:FORX=140TO50STEP-20:PUT(
X,Y)-(X+32,Y+14),B,OR:Y=Y+8:NEXT
:Y=38:FORX=152TO92STEP-20:PUT(X,
Y)-(X+32,Y+14),B,OR:Y=Y+8:NEXT:Y
=52:FORX=164TO122STEP-20:PUT(X,Y
)-(X+32,Y+14),B,OR:Y=Y+8:NEXT
13 Y=66:FORX=176TO142STEP-20:PUT
(X,Y)-(X+32,Y+14),B,OR:Y=Y+8:NEX
T:PUT(188,80)-(220,94),B,OR:FORY
=0TO28STEP14:PUT(0,Y)-(20,Y+12),
MR,OR:NEXT
14 PMODE1,M:DRAW"S12BM46,"+STR$(
```

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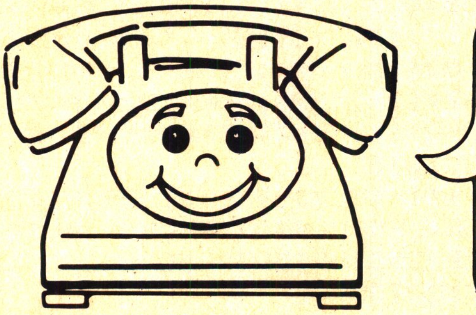
```
YP)+"ND4R2D2NL2BR2ND2U2R2D2L2F2B
R2NR2U2NRU2R2BR2NR2D2R2D2NL2BR2R
2U2L2U2R2BR6ND4R2D2NL2D2BR2U4F2N
D2U2BR2F2ND2E2BR6D2NE2NF2D2BR4NR
2U2NRU2R2BR2F2ND2E2":IFYP=0THENS
CREEN1,0
15 IFINKEY$=""THEN15ELSEPMODE1,3
:PCLS:PMODE1,1:LINE(45,0)-(211,1
2),PRESET,BF:PMODE1,3:PCOPY1TO3:
PCOPY2TO4:COLOR2:LINE(218,0)-(23
8,12),PSET,B:PAINT(222,2),3,2
16 PMODE1,3:LINE(X2,Y2)-(X2+20,Y
2+24),PRESET,BF:Y2=Y2-28:PCOPY3T
O1:PCOPY4TO2:PMODE1,1:PUT(138,4)
-(158,28),MR,OR:X1=138:Y1=4:PLAY
"T255V31":SCREEN1,0
17 GET(140,22)-(150,30),RX,G:GET
(82,124)-(92,148),SX,G:PB=0:X3=8
2:Y3=124:X4=140:Y4=22:TIMER=0
18 X=JOYSTK(0):Y=JOYSTK(1):IFX<1
0ANDY>50GOSUB28ELSEIFX>50ANDY>50
GOSUB30ELSEIFX>50ANDY<10GOSUB32E
LSEIFX<10ANDY<10GOSUB34
19 IFB=1THEN20ELSEIFPPOINT(136,2
2)=C ANDPPOINT(116,38)=C ANDPPOI
NT(96,54)=C ANDPPOINT(76,70)=C A
NDPPOINT(56,86)=C ANDPPOINT(36,1
02)=C ANDPPOINT(148,50)=C ANDPPO
INT(128,66)=C ANDPPOINT(108,82)=
C ANDPPOINT(88,98)=C ANDPPOINT(6
8,114)=C THENA=1:B=1
20 IFA=1THENIFPPOINT(160,78)=C A
NDPPOINT(140,94)=C ANDPPOINT(120
,110)=C ANDPPOINT(100,126)=C AND
PPOINT(172,106)=C ANDPPOINT(152,
122)=C ANDPPOINT(132,138)=C ANDP
POINT(184,134)=C ANDPPOINT(164,1
50)=C ANDPPOINT(196,162)=C THEND
=1
21 IFD=1THENCS=CS+1:C=C+1:PMODE1
,3:PAINT(222,2),C+1,2:PMODE1,1:A
=0:B=0:D=0:IFC=4THENC=1ELSEC=3
22 IFTIMER>100GOSUB26
23 PUT(204,2)-(214,10),RA,OR:PUT
(240,2)-(250,10),LA,OR:IFPL=3AND
PR=3THENPMODE1,3:PL=0:PR=0:PUT(6
6,42)-(84,52),P,OR:PUT(192,88)-(
210,98),P,OR:PMODE1,1
24 IFSC=>SS THENSS=SS*2:Y2=Y2+28
:PMODE1,3:PUT(X2,Y2)-(X2+20,Y2+2
4),MR,OR:PMODE1,1:IFY2=>140THENY
2=112
25 IFTIMER>210THENSP=1:GOSUB40:G
OTO18ELSE18
26 PUT(X4,Y4)-(X4+10,Y4+8),RX,AN
D:IFPB=6THENX4=140:Y4=22:PB=0:GE
T(X4,Y4)-(X4+10,Y4+8),RX,G:RETUR
NELSEIFRND(2)=1THENX4=X4-20:Y4=Y
```



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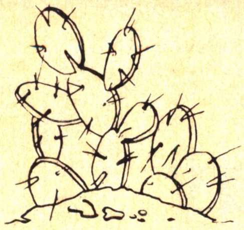
```
4+16ELSEX4=X4+12:Y4=Y4+28
27 GET(X4,Y4)-(X4+10,Y4+8),RX,G:
PUT(X4,Y4)-(X4+10,Y4+8),R,OR:PLA
Y"O3C":PB=PB+1:IFSGN(X1+2-X4)=0A
NDSGN(Y1+18-Y4)=0THENPB=0:GOTO52
ELSERETURN
28 X1=X1-20:Y1=Y1+16:IFX1=18ORX1
=50ORX1=82ORX1=114ORX1=146ORX1=1
78THEN50ELSEPMODE1,3:PAINT(X1,Y1
+22),C,2
29 PCOPY3TO1:PCOPY4TO2:PMODE1,1:
PUT(X1-4,Y1)-(X1+16,Y1+24),ML,OR
:PLAY"O1BB":SC=SC+(10*CS):GET(X4
,Y4)-(X4+10,Y4+8),RX,G:RETURN
30 X1=X1+12:Y1=Y1+28:IFX1=210ORX
1=178ORX1=146ORX1=114ORX1=82ORX1
=50THEN50ELSEPMODE1,3:PAINT(X1,Y
1+22),C,2
31 PCOPY3TO1:PCOPY4TO2:PMODE1,1:
PUT(X1,Y1)-(X1+20,Y1+24),MR,OR:P
LAY"O1BB":SC=SC+(10*CS):GET(X4,Y
4)-(X4+10,Y4+8),RX,G:RETURN
32 X1=X1+20:Y1=Y1-16:IFY1<0THENY
1=0:GOTO50:ELSEIFX1=194THEN38ELS
EIFX1=170ORX1=182ORX1=206ORX1=21
8THEN50ELSEPMODE1,3:PAINT(X1,Y1+
22),C,2
33 PCOPY3TO1:PCOPY4TO2:PMODE1,1:
PUT(X1,Y1)-(X1+20,Y1+24),MR,OR:P
LAY"O1BB":SC=SC+(10*CS):GET(X4,Y
4)-(X4+10,Y4+8),RX,G:RETURN
34 X1=X1-12:Y1=Y1-28:IFY1<0THENY
1=0:GOTO50:ELSEIFX1=66THEN36ELSE
IFX1=86ORX1=46ORX1=26THEN50ELSEP
MODE1,3:PAINT(X1,Y1+22),C,2
35 PCOPY3TO1:PCOPY4TO2:PMODE1,1:
PUT(X1-4,Y1)-(X1+16,Y1+24),ML,OR
:PLAY"O1BB":SC=SC+(10*CS):GET(X4
,Y4)-(X4+10,Y4+8),RX,G:RETURN
36 IFPL=3THEN50ELSEPL=1:PMODE1,3
:LINE(66,42)-(84,52),PRESET,BF:P
MODE1,1:FORY1=Y1 TO4STEP-4:X1=X1
+4:PCOPY3TO1:PCOPY4TO2:PUT(X1-4,
Y1-4)-(X1+16,Y1+20),MR,OR:PUT(X1
-4,Y1+18)-(X1+14,Y1+28),P,OR:PLA
Y"O5ABCDCBABCDCBABCDCBA"
37 ONPL GOSUB40,47:NEXT:PCOPY3TO
1:PCOPY4TO2:PUT(118,20)-(138,44)
,MR,OR:X1=118:Y1=20:PL=3:SP=0:GO
TO17
38 IFPR=3THEN50ELSEPR=1:PMODE1,3
:LINE(192,88)-(210,98),PRESET,BF
:PMODE1,1:FORY1=Y1 TO12STEP-8:X1
=X1-2:PCOPY3TO1:PCOPY4TO2:PUT(X1
-4,Y1-4)-(X1+16,Y1+20),ML,OR:PUT
(X1,Y1+18)-(X1+18,Y1+28),P,OR
39 PLAY"O5ABCDCBABCDCBABCDCBA":O
NPR GOSUB40,46:NEXT:PCOPY3TO1:PC
OPY4TO2:PUT(146,32)-(166,56),ML,
OR:X1=150:Y1=32:PR=3:SP=0:GOTO17
40 IFSP=0THENRETURNELSEPUT(X3+2,
Y3+2)-(X3+12,Y3+26),SX,AND
41 IFSGN(X1-X3)=1ANDSGN(Y1-Y3)=-
1THENX3=X3+20:Y3=Y3-16:GOTO43ELS
EIFSGN(X1-X3)=-1ANDSGN(Y1-Y3)=-1
THENX3=X3-12:Y3=Y3-28:GOTO43ELSE
IFSGN(X1-X3)=1ANDSGN(Y1-Y3)=1THE
NX3=X3+12:Y3=Y3+28:GOTO43
42 IFSGN(X1-X3)=-1ANDSGN(Y1-Y3)=
1THENX3=X3-20:Y3=Y3+16
43 IFX3=82ORX3=94ORX3=114ORX3=14
6ORX3=178THENX3=X3+8:Y3=Y3-44
44 IFX3=86THENX3=X3-8:Y3=Y3+44
45 GET(X3+2,Y3+2)-(X3+12,Y3+26),
SX,G
46 IFX3=182ORX3=194THENX3=X3:Y3=
Y3+20:PR=2
47 IFX3=66THENX3=X3:Y3=Y3+25:PL=
2:ELSEIFPL=1AND(X3=98ORX3=78)THE
NPL=2:X3=66
48 PUT(X3+2,Y3+2)-(X3+12,Y3+26),
S,OR:PLAY"O3G#"
49 IFSGN(X1-X3)=0ANDSGN(Y1-Y3)=0
THEN52ELSERETURN
50 SCREEN1,1:FORY1=Y1 TO190STEP1
0:PCOPY3TO1:PCOPY4TO2:PUT(X1,Y1)
-(X1+20,Y1+24),MR,OR:PLAY"O4AGGA
DEV-":NEXT:PLAY"V31":PCOPY4TO2:S
CREEN1,0
51 SC$=STR$(SC):IFY2=-28THEN53EL
SEY9=12:FORR=2TOLEN(SC$):S$=N$(V
AL(MID$(SC$,R,1))):DRAW"S4BM"+ST
R$(Y9)+",178"+S$:Y9=Y9+10:NEXT:F
ORR=1TO26:COLORQ:LINE(6,174)-((L
EN(SC$)*12),192),PSET,B:PLAY"O1T
5A#":Q=Q+1:IFQ=3THENQ=1:NEXTELSE
NEXT:GOTO16
52 PUT(X1-18,Y1-4)-(X1+38,Y1+28)
,SA,PSET:FORR=0TO1:PLAY"T10O1BO4
DP10O2EP20O4GP15O3AP5GAP5O1CT255
":NEXT:GOTO51
53 Y9=116:PMODE1,3:PCLS:DRAW"S16
BM54,10GD4FR4EU4HNL4BD4F2BU3R4BR
ND3U3F6U6BRNR6D3NR3D3R6BRU6R6D3L
6F3BR4U6R4FD4GL4S8C2BM76,50HL4GD
4FR4EUHNL2BD3BR3U3E3F3NL5D3BR2U6
F3E3D6BR2NR4U3NR2U3R4BR8BDD4FR4E
U4HL4BR7D3F3E3U3BR2NR4D3NR2D3R4B
R2U6R4D3L4F3S8
54 DRAW"C3BM96,74F3ND3E3BR2BDD4F
R4EU4HL4BR7D5FR4EU5BR2ND6R4D3L4F
3BM92,150FR4EUHL4HUER4FBR2D4FR4B
U6NL4BR2BDD4FR4EU4HL4BR7ND6R4D3L
4F3BR3NR4U3NR2U3R4C4":FORR=2TOLE
N(SC$):S$=N$(VAL(MID$(SC$,R,1)))
:DRAW"BM"+STR$(INT(Y9-LEN(SC$)*4
))+",105"+S$:Y9=Y9+14:NEXT
55 SCREEN1,0:SC=0:Y2=56:M=3:YP=1
70:C=3:CS=1:SS=4000:GOTO10
```



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What can we say about the absolute best state-of-the-art programmer's utility. This program adds 35 commands to BASIC that should have been there all along and no short description will do it justice. Summary — light or dark screen, keyclick, screen editor, programmable keys, a super memory tool, variable listing echo to printer, BREAK disable, convert machine language to DATA, global search, single step thru program run, double space printouts of program listings — that's less than half of what it will do. It takes about 6K of space, and if you have 64K you can put it up high and lose no BASIC space at all. 100% ML. Fully relocatable. See the great reviews in Nov. '83 issues of hot Cocoa and Color Computer magazine. **Tape — $34.95; Disk — $39.95**

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Another great utility from the clear leader in Color Computer Utilities! This program will free you from your Rom packs by easily and automatically moving them to tape or disk. Unlike other programs of this type, the files created can be loaded and EXECuted just like any other program. No boot loader is needed! Once your Rom packs are in memory, you can examine and modify them using standard ML routines. Disk drive owners will particularly want to take note, as **ROM FREE** will free you from ever having to unplug your controller. Information needed to create working backups of virtually all known Rom packs is included. Get those Rom packs onto disk or tape. 100% Machine Language. Requires a 64K color computer, any BASIC, disk or tape. **$24.95**

### Colorcal

FEB
14
MAR
Call Beth
17
APR
1

is a very different calendar program. You enter all the dates that are important to you, like birthdays, anniversaries, or any other event in your life that falls on the same day each year, and then you save the program. It actually modifies itself as you enter your events, so they become a part of the program, and all the holidays are already programmed in. Now, anytime you want, you can load the program, specify any year or month you like, and a correct calendar for that month or year will be printed on either the screen or a printer. The calendars it prints make a great gift, and you won't miss those important days anymore. Requires 16K and Extended BASIC. **Tape — $24.95; Disk — $29.95**

### Clone Master

This is the ultimate disk backup utility, and who else but Prickly-Pear, originators of Omni-Clone, could bring it to you. If you are tired of waiting for your BACKUP command to finish, you'll like the speed of CLONE MASTER. This program checks the computer memory size, and if you have a 64K machine it will do a backup on a full disk in about 7 minutes — including formatting the destination disk — with only THREE swaps, not the seven you are used to, and if you are running multiple drives, CLONE MASTER will handle up to 4 double-sided drives. In addition, although we can't guarantee that CLONE MASTER will back up any disk, it can handle backups of most non-standard (protected) disks we have seen — not only on the Color Computer, but on Model III and IV, IBM PC, Kaypro, and Osborne. It handles up to 256 tracks, single and double density — even on the same track, CRC errors, and lots more. It even checks the speed of your drives for you! If you are using a disk drive, you know how disks will crash, so don't leave your valuable software unprotected any longer. Back it up or lose it! CLONE MASTER will adjust to any memory size and works with any version of the ROM's — including the JVC controller. **$39.95**

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**PRINTER MYSTERY**

16K
ECB

# The First Saturday In May

By Michael J. Himowitz
and
Julius Nelson

*This is the sixth installment in a continuing series of short 'Printer Mysteries' which began in November.*

Kentucky is known for beautiful, rolling bluegrass hills, *the Rainbow,* fast horses and especially to the sports-minded, "the most exciting two minutes in sports" — The Kentucky Derby. The first Saturday in May is a long-awaited day filled with celebration and excitement so thick you can cut it with a knife . . . or a racing ticket.

For those of you who have the *Printer Artist* program from the November *Rainbow,* here's a printer mystery symbolizing that special day and the beauty of Kentucky. *RUN* the program and enter the characters below, line by line. For example, 2X means strike the "X" key two times; 5sp means hit the space bar five times, etc. Consult the instructions in the November issue.

If you are interested in sophisticated printer art development, a complete "Printer Artist" system is available from Federal Hill Software, 825 William St., Baltimore, Md., 21230.

```
Line
  1  69:
  2  69:
  3  45:, 2X, 10:, 1X, 11:
  4  43:, 3X, 9:, 2X, 12:
  5  41:, 4X, 7:, 4X, 13:
  6  27:, 11X, 1sp, 5X, 2sp, 3X, 2:, 4X, 14:
  7  22:, 14X, 2sp, 5X, 2sp, 1X, 1sp, 1X, 1sp, 5X, 15:
  8  18:, 14X, 4sp, 6X, 2sp, 3X, 2sp, 4X, 16:
  9  15:, 11X, 4sp, 11X, 2sp, 5X, 2sp, 1X, 18:
 10  12:, 9X, 3sp, 15X, 3sp, 8X, 19:
 11  9:, 8X, 3sp, 17X, 3sp, 11X, 18:
 12  7:, 7X, 2sp, 23X, 2sp, 11X, 17:
 13  5:, 6X, 2sp, 28X, 2sp, 10X, 16:
 14  3:, 6X, 2sp, 31X, 3sp, 8X, 16:
 15  3:, 4X, 2sp, 35X, 3sp, 6X, 16:
 16  3:, 2X, 2sp, 21X, 1sp, 18X, 4sp, 2X, 16:
 17  5:, 21X, 2sp, 4X, 1sp, 17X, 4sp, 1X, 14:
 18  5:, 19X, 2sp, 6X, 1sp, 11X, 3sp, 4X, 3sp, 1X, 14:
 19  6:, 16X, 2sp, 8X, 1sp, 11X, 3sp, 4X, 4sp, 1X, 13:
```

```
 20  6:, 14X, 2sp, 10X, 1sp, 5X, 1sp, 12X, 5sp, 1X, 12:
 21  7:, 12X, 2sp, 11X, 1sp, 4X, 3sp, 12X, 5sp, 1X, 11:
 22  8:, 10X, 2sp, 12X, 1sp, 6X, 3sp, 11X, 4sp, 1X, 11:
 23  9:, 8X, 2sp, 13X, 1sp, 8X, 2sp, 11X, 4sp, 1X, 10:
 24  10:, 6X, 2sp, 13X, 2:, 9X, 3sp, 10X, 4sp, 1X, 9:
 25  11:, 4X, 2sp, 13X, 4:, 10X, 2sp, 10X, 4sp, 1X, 8:
 26  12:, 2X, 2sp, 14X, 5:, 10X, 3sp, 10X, 3sp, 1X, 7:
 27  15:, 15X, 7:, 10X, 2sp, 10X, 3sp, 1X, 6:
 28  16:, 13X, 10:, 9X, 3sp, 9X, 3sp, 1X, 5:
 29  17:, 12X, 12:, 5X, 2sp, 3X, 1sp, 8X, 4sp, 1X, 4:
 30  18:, 10X, 18:, 14X, 5sp, 1X, 3:
 31  19:, 9X, 20:, 4X, 2sp, 6X, 1sp, 2X, 2sp, 1X, 3:
 32  21:, 7X, 22:, 3X, 2sp, 4X, 2sp, 2X, 1sp, 1X, 4:
 33  22:, 6X, 24:, 3X, 2sp, 3X, 2sp, 1X, 1sp, 1X, 4:
 34  25:, 3X, 25:, 3X, 2sp, 2X, 4sp, 1X, 4:
 35  54:, 3X, 1sp, 2X, 2sp, 2X, 5:
 36  56:, 2X, 11:
 37  69:
 38  69:
```

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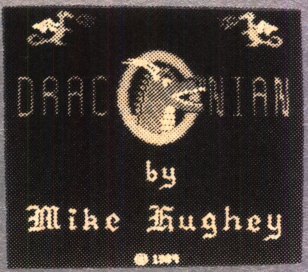
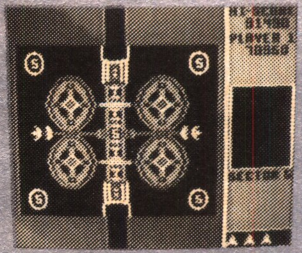
*(Michael Himowitz is a Washington correspondent for the Baltimore Evening Sun and proprietor of Federal Hill Software. He uses his computer extensively and has written several programs including "CoCo Accountant." He is interested in meeting people who use their computers in journalism.)*





## DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space-mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

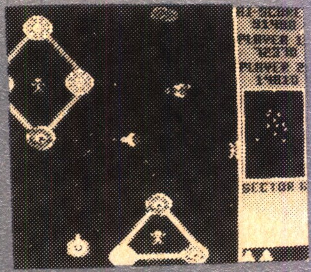
Finally, the enemy base comes into view. Avoiding the enemy fire, you destroy the gun turrets one by one with your rapid-fire torpedoes. Then, with the explosions still echoing around you, you rescue the astronaut who was being held prisoner by the enemy. Your mission is far from over, however, as there are more bases to destroy and more astronauts to rescue before the sector will be secured. And all must be done quickly; if you are too slow, the invincible DRACONIAN will surely seek you out as its next victim.

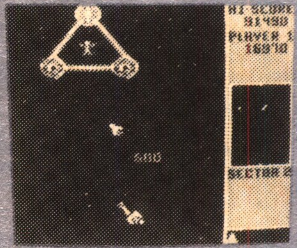
This is it — the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!

**JOYSTICKS REQUIRED**

**32K MACHINE LANGUAGE**

**TAPE $27.95** **DISK $30.95**





CHAMBERS
TOM MIX

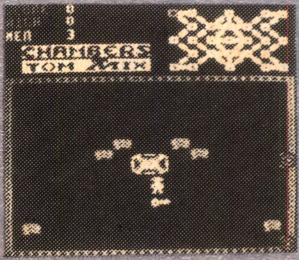
## CHAMBERS

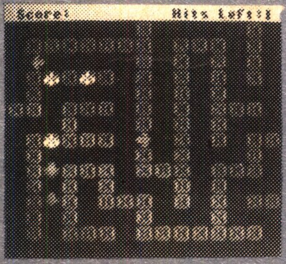
Exciting high resolution graphics game. Multiple screens. Outstanding sound, Chambers is loosely based on Cosmic Chasm. The object in each level is to destroy all of the evil creatures in each room and then go into the main reactor room and blow up the base.

**JOYSTICKS REQUIRED**

**32K MACHINE LANGUAGE**

**TAPE $24.95** **DISK $27.95**





## WAREHOUSE MUTANTS

Journey through the warehouse seeking out the Mutants who are out to destroy you. WATCH OUT! They will push crates trying to crush you! Outstanding realism—high resolution graphics—multiple screens.

**JOYSTICKS REQUIRED**

**16K MACH. LANGUAGE**

**TAPE $24.95**

**DISK $27.95**

## QUIX

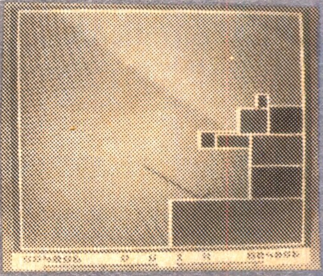
This one is after a popular arcade game with a similar name. Simply frustrating—you'll love it. Done in high resolution graphics with Super Sound.

**JOYSTICKS REQUIRED**

**32K MACH. LANGUAGE**

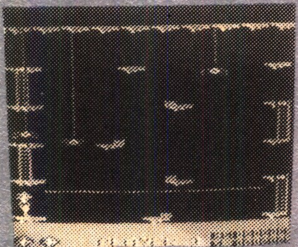
**TAPE $24.95**

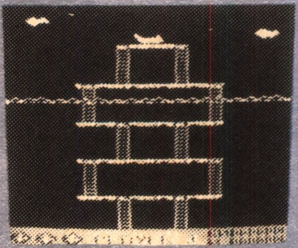
**DISK $27.95**



## CRASH

This game is a high resolution Machine Language program with outstanding Arcade type graphics. The game consists of 4 screens. Fly the airplane over and through obstacles. Piloted by "Mario" who also appeared in "The King". The object is to conquer one screen after another but don't "Crash". Great fun for the whole family. For 1 or 2 players. Uses joysticks.





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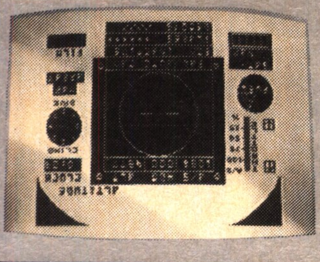
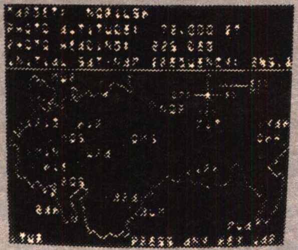




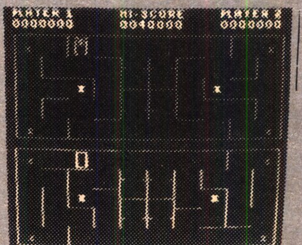
## SR-71

SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Elude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adventurous. Fantastic graphics, color and sound. **32K Ext. Basic** **TAPE $28.95** **DISK $31.95**

## SKRAMBLE

Your mission is to penetrate the enemy skramble system and destroy their headquarters. You will start with three of our latest spacefighters equipped with repeating cannon and twin bomb launcher. If you succeed in evading the elaborate ground defenses, you will arrive at the Cave where flying becomes more difficult. In the cave are UFOs, after which you must avoid a hail of meteorites. Very few pilots succeed this far, but if you do, then you must enter the Fortress, followed by the Maze. One or two player game. Machine Language, high speed, Arcade action. Full color graphics with sound. Keyboard or joystick control.

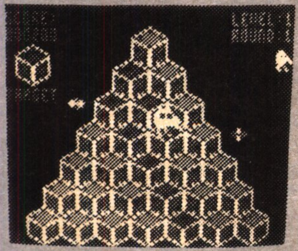
**16K MACHINE LANGUAGE** **TAPE $24.95** **DISK $27.95**



## GRABBER

A pac type game. Two complete mazes jump from one to the other. Probably the most outstanding sound you have ever heard. Arcade Action. Method of play, you are the Grabber. The object is to grab the 8 treasures and store them in the center boxes. You start with 3 Grabbers and get extra ones at 20,000 points. Watch out for the googlies! Super high resolution graphics.

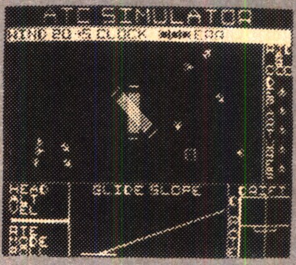
**32K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## CU✻BER

Approaches the excitement and challenges of any Video Arcade. The hazards of CU✻BER are many. Help CU✻BER change the colors on the pyramid while avoiding many of the dangers always present. Vipers, the Nurd, the Dork, bonus points all add up to another exciting release from Tom Mix Software.

**32K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## AIR TRAFFIC CONTROLLER

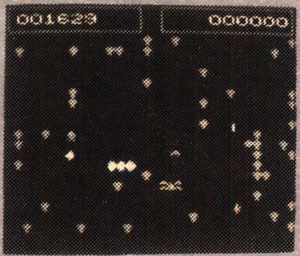
Air Traffic Controller is a computer model of an air traffic control situation for the TRS-80 Color Computer. Remotely Piloted Vehicles (RPV's) are operated by the controller in a situation similar to that of a commercial airline in that you must regulate landings and takeoffs of the vehicles.

**32K EXT. BASIC**
**TAPE $28.95** **DISK $31.95**

## KATERPILLAR II

The color computer has needed a perfect centipede type game since day one. You will throw all imitations aside when you see this. So close to the arcade you will start digging for quarters. Grapic to equal "The King" and "Buzzard Bait." Joysticks required.

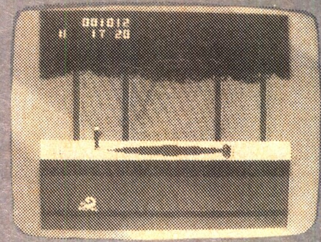
**16K MACHINE LANGUAGE**
**TAPE $24.95** **DISK $27.95**



## TRAPFALL

The "Pitfalls" in this game are many. Hidden treasures, jump over the pits, swing on the vine, watch out for alligators, beware of the scorpion. Another game for the Color Computer with the same high resolution graphics as "The King."

**16K MACHINE LANGUAGE**
**TAPE $27.95** **DISK $30.95**



## OTHER GREAT GAMES

**MAZE RACE** is a one or two player game. Play either against the built in timer or against your favorite opponent. **16K Machine Language** **$17.95**

**PROTECTORS** Exciting fast paced arcade game that looks and plays like the popular arcade game "Defender." Wave after wave of enemy fighters drop bombs on your city. **32K Ext. Basic**
**TAPE $24.95** **DISK $27.95**

**SOLO POOL** Now play pool with your color computer. Two players. Plays like machine language. Super Color, high resolution graphics. **16K Ext. Basic** **$17.95**

**CUTHBERT** Run your man on the outline of the squares. When you complete a square it fills in. Fill in all the squares before the bugs get you, and you win. Uses joysticks, one or two players. **16K Machine Language**
**TAPE $20.95** **DISK $23.95**

**BIRD ATTACK** A fast paced machine language arcade game. Shoot the birdmen before they descend upon you. Watch out for their bombs! **16K Machine Language** **$21.95**

## UTILITIES

**SCREEN PRINT ROUTINE** Prints contents of your graphic screen to an Epson, Microline or Radio Shack DMP Printers. Prints positive or reverse format. Horizontal or vertical, small and large printout. Print left, right or center of page. Specify printer when ordering. **TAPE $19.95** **DISK $21.95**

**PROGRAM PRINTER** This program will list basic programs to your printer in two column format. Saves paper and makes your listing look professional. Disk based. **$17.95**

**TAPE TO DISK** New version works on both 1.0 and 1.1 DOS. Load the contents of most tape to disk automatically. **Machine Language**
**TAPE $17.95** **DISK $21.95**

**MAIL LIST** Maintain a complete mailing list with phone numbers, etc. **Ext. Basic** **DISK ONLY $17.95**

**COLOR MONITOR** Written in position independent code. (May be located in any free memory). Very compact. Only occupies 1174 bytes of memory. Full featured, includes Break-Pointing of machine language programs, register display and modify, memory display and modify, and block memory move commands. Displays memory in hex and ascii format on one line 8 bytes long. **Machine Language**
**TAPE $24.95** **DISK $27.95**

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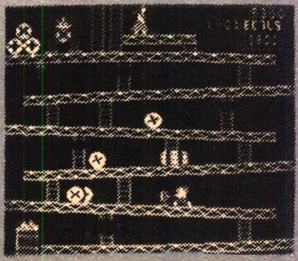
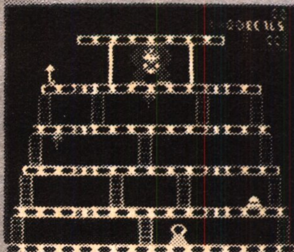
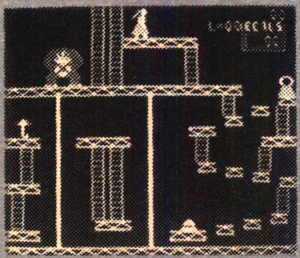


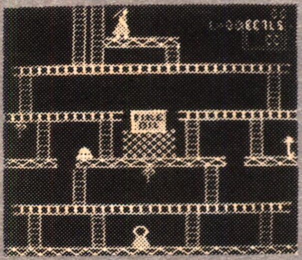


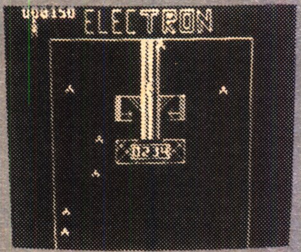
## THE KING

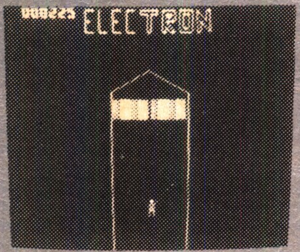
This game contains all 4 full graphic screens like the popular arcade game. Exciting sound and realistic graphics. Never before has the color computer seen a game like this. Early reviews say simply outstanding.

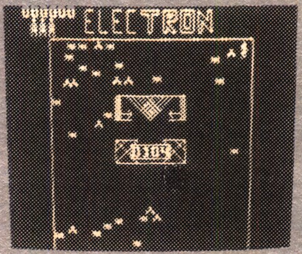
**JOYSTICKS REQUIRED**
**32K MACHINE LANGUAGE**
**TAPE $26.95**
**DISK $29.95**

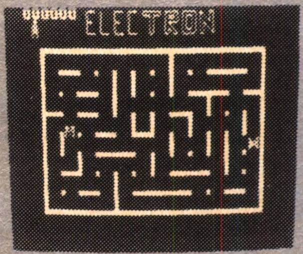








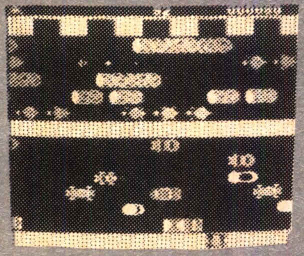




## ELECTRON

Electron is composed of four subgames. You must complete one level in order to advance to the next. Supplied with four men, you are subjected to more difficult games as you move ahead. Beam Buggy, Prachnids, Force Fields and a Maze!

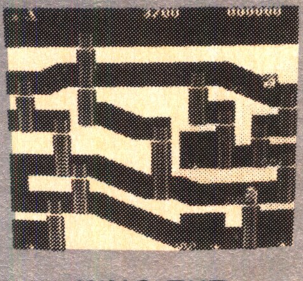
**JOYSTICKS REQUIRED**
**16K MACHINE LANGUAGE**
**TAPE $24.95 DISK $27.95**



## THE FROG

This one will give you hours of exciting play. Cross the busy highway to the safety of the median and rest awhile before you set out across the swollen river teaming with hidden hazards. Outstanding sound and graphics. Play from keyboard or joysticks.

**16K MACHINE LANGUAGE**
**TAPE $27.95 DISK $30.95**



## KING TUT

Journey through the caverns of King Tut's tomb. You are on a quest to find treasures hidden in the cavrns below. You light your way with only a small candle that grows dimmer as time passes. Watch out for the snakes and the ghost of King Tut himself. **Five** screens challenge your abilities every step of the way. Joysticks required.

**16K MACHINE LANGUAGE**
**TAPE $27.95 DISK $30.95**

## THE TOUCHSTONE

You are one of many priests of Ra who has accepted the challenge of the touchstone. The challenge is a way for any of Ra's followers to become a favored high priest. Given limited use of Ra's powers, you will battle hidden dangers. Entering the mazes, you must be ready for anything.

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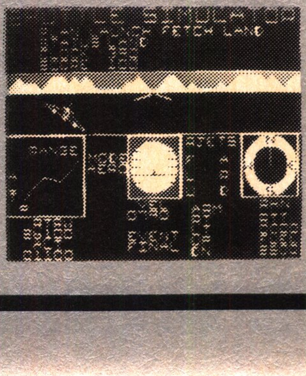

## SPACE SHUTTLE

This program gives you the real feeling of flight. Full instrumentation complete to the max. Radar, altimeter, air speed, artificial horizon, fuel gauge, a mission status panel and much more. Actual simulation of space flight, weather conditions must be considered.

**JOYSTICKS REQUIRED**
**32K EXTENDED BASIC**
**TAPE $28.95 DISK $31.95**

# EDUCATIONAL

## VOCABULARY MANAGEMENT SYSTEM

**16K Extended basic/32K for printer output TAPE $39.95 DISK $42.95**

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 9 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

—As many as 300 vocabulary words and definitions may be in the computer's memory at one time.
—Words and definitions may be saved on disk or tape.
—Remarks and/or comments can be saved with word files.
—A disk loading menu allows students to load disk files without typing file names.
—Word lists may be quickly alphabetized
—The three printer segments allow you to create and print individualized tests, puzzles, word-searches and worksheets.
—Answer keys may be printed for all worksheets and puzzles.
—The printer segments allow full use of your printer's special features.
—The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

## STORY PROBLEMS

**STORY PROBLEMS** is a program that is designed to give practice in solving story problems (sometimes called statement thought or word problems) on the Color Computer. It is suitable for use in either a home or school environment. It is also a tool that will allow you to create new story problems to suit your children's needs and ability levels. It has many features that make it particularly attractive:

- Story problems involving addition, subtraction, multiplication, division or a combination of the four are presented to the student by slowly scrolling each letter of each problem onto the screen.
- Up to 5 students may use the program at the same time.
- There are 4, user modifiable, skill levels.

**16K EXT. BASIC TAPE $19.95 DISK $22.95**

## MATH DRILL

**MATH DRILL** is a program designed to help children to practice addition, subtraction, multiplication and division skills on the Color Computer. It has several features that make its use particularly attractive:

- Up to 6 students may use the program at the same time.
- Answers for addition, subtraction and multiplication are entered from right to left, just as they are written on paper.
- Commas may be included in the answers.
- Partial products for the multiplication problems may be computed on the screen.
- Division answers that have a remainder are entered as a whole number followed by the letter "R" and the remainder.
- The are ten, user modifiable, skill levels.
- A "SMILEY FACE" is used for motivation and reward. Its size increases relative to the skill level.
- Skill levels automatically adjust to the student's ability.
- A timer measures the time used to answer each problem and the total time used for a series of problems.
- After a problem has been answered incorrectly the correct answer appears under (above in division) the incorrect answer.

**REQUIRES 16K EXT. BASIC**
**TAPE $19.95 DISK $22.95**

## ESTIMATE

**ESTIMATE** is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer. It has many features that make its use particularly attractive:

- Up to 5 students may use the program at the same time.
- There are 5, user modifiable, skill levels.
- The acceptable percent error may be changed as a student's skill improves.
- A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- The (BREAK) key has been disabled so that a child will not inadvertently stop the program from running.

**REQURIES 16K EXT. BASIC**
**TAPE $19.95 DISK $22.95**

**SPECIAL**
**EDUCATIONAL PACKAGE**
**SPELLING TEST — WORD DRILL**
**MATH DRILL — ESTIMATE**
**STORY PROBLEMS**
**ALL FOR**
**TAPE $79.95 DISK $82.95**

## TEACHER'S DATABASE

**TEACHER'S DATABASE** is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
- The program will run from cassette or disk.
- Cassette and disk files are completely compatible.
- The program is menu driven.
- Records may be easily changed, deleted, combined or added.
- Information about students may be numerical or text.
- Records may be quickly alphabetized.
- Records may be sorted by various criteria.
- Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.

**REQURES 32K EXT. BASIC**
**TAPE $39.95 DISK $42.95**

## PRE-ALGEBRA I INTEGERS

**INTEGERS** is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing and/or maintaining skills:

- Up to 4 students may use the program at the same time.
- There are 9, user modifiable, skill levels.
- Students are given two opportunities to answer a problem.
- A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: $-12 + -9 = ?$. The second program presents a problem with missing numerals in this format: $-7 - ? = 18$. The third program presents a problem with a missing sign: $8 - ?6 = 14$. The last program asks the student to determine the relationship (=,  or  ) between two statments $3 - 9$ (??) $-4 - 5$.

**TAPE $29.95 DISK $32.95**

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GREETINGS from
UNCLE BERT

## Greetings!

Spring has sprung at last, at least out here in Ypsilanti. The snail is on the leaf. The worm is on the bud. The corn is planted. The pigs are enchanted. And Ben, having cast off his winter fur, prances about in sleek abandon.

Ben and I took a walk down to the pond the day before yesterday. Ben scampered on ahead, scattering out occasional rabbits and quail, yapping and barking for joy. Upon reaching the pond, Ben suddenly froze. Slowly he lowered down on his haunches like a sphinx, narrowed his nose, and began softly whining as if he had just been kissed by a rabbit in a dream. In a minute, I saw what all the commotion was about. Do you remember that turtle I saw swimming in circles on the pond last summer? Well, now that very turtle was swimming around in the pond, followed by seven little tiny turtles. The turtle had replicated.

Gosh, those little turtles were cute. They were just exactly like the mother turtle, only miniature. The mother turtle turned one way, and they followed right along. The mother turtle turned another way, and along they followed. First I considered taking them all home with me to try turtle graphics on paper, just as I had done with the big turtle last summer. But then I didn't want to disturb an idyllic scene on the pond. Also, it's not nice to disturb a mother and her babes.

Luckily, there is a way to have my own turtle on my Color Computer produce its own baby turtles. The statement to do this is called HATCH, and I'll see if I can show you how it works. First, think of a procedure — any procedure. For example, the procedure for drawing a circle:

```
TO CIRCLE :N
   Repeat 20 (FD :N RT 18)
   END
```

---

*(W. Bert Woofensburger ["Uncle Bert"] manages a hog and corn farm near Ypsilanti, Mich. He has recently acquired a Color Computer and is learning LOGO. Woofensburger's editor and assistant, Dale Peterson, writes for a living. His recent books include "Genesis II: Creation and Recreation With Computers" and "Intelligent Schoolhouse: Readings On Computers and Learning." He is currently working on a book about Color LOGO with Don Inman and Ramon Zamora, to be published in 1984.)*

Next, tell the turtle to go through the procedure, and have a hatched turtle, or two or three of them, do the same. Like so:

```
TO CIRCLES
   SX 90 SY 80
   HATCH 1 CIRCLE 8
   SX 20 SY 170
   HATCH 2 CIRCLE 3
   SX 100 SY 100
   HATCH 3 CIRCLE 5
   SX 140 SY 120
   CIRCLE 4
   END
```

An even smarter way to do the procedure would be like this:

```
TO CIRCLE :N :X :Y
   SX :X SY :Y
   REPEAT 20 (FD :N RT 18)
   END

TO CIRCLES
   HATCH 1 CIRCLE 8 90 80
   HATCH 2 CIRCLE 3 20 170
   HATCH 3 CIRCLE 5 100 100
   CIRCLE 4 140 120
```

The last CIRCLE procedure doesn't need to be hatched because that is being run by the mother turtle. I could have called the last CIRCLE procedure

```
HATCH 0 CIRCLE 4 140 120
```

because HATCH 0 means the same as "no hatch," and really refers to the mother turtle.

Why did I put the mother turtle's procedure last? I asked myself that — but I remembered my own mother, bless her. When there was a bowl of potatoes on the table, who always waited until the little darlings had their potatoes? Mother! When there was spinach on the table, who always waited until we had been served our spinach (even though we hated spinach)? Mother! So it shouldn't be surprising that the mother turtle comes last here. Just for the sake of scientific experimentation, I tried putting the mother turtle first in the CIRCLES procedure. What happened? You try it, and see for yourself.

```
TO CIRCLES2
   CIRCLE 4 140 120
   HATCH 1 CIRCLE 8 90 80
   HATCH 2 CIRCLE 3 20 170
   HATCH 3 CIRCLE 5 100 100
   END
```

What I discovered was that once the mother turtle finishes, the whole procedure just stops — which means that the hatching in CIRCLES2 never does happen. Now, if the whole procedure stops when the mother turtle finishes, we may have another problem. Even though the mother turtle's subprocedure is last in a procedure, what happens if her subprocedure is simpler than the others, and she still finishes early? I tried it:

```
TO SQUARE
   SX 200 SY 40
   REPEAT 4 (FD 20 RT 90)
   END
```

```
TO SHAPES
   HATCH 1 CIRCLE 8 90 80
   HATCH 2 CIRCLE 3 20 170
   SQUARE
   END
```

Again, even though the mother turtle may look (on the screen) like all the hatched turtles, she is different. When the mother turtle finishes, the entire procedure stops, even if the hatched turtles have not finished with their subprocedures. Apparently, they "dehatch." Since it is simpler (takes fewer REPEATS) to do a SQUARE, the mother turtle finishes first and all the hatched turtles stop working on their circles, even though they haven't finished. It is most sensible, therefore, to give the mother turtle the most complex subprocedure and to place her last in a hatching procedure. Nevertheless, if for any weird and peculiar reasons you still wish to give the mother turtle a simpler subprocedure than a hatched turtle has, you can tell her to VANISH — and she vanishes once she has finished her subprocedure, while the little hatched turtles are left to carry out their subprocedures without maternal interruption. For instance:

```
TO SHAPES2
   HATCH 1 CIRCLE 8 90 80
   HATCH 2 CIRCLE 3 20 170
   SQUARE
   VANISH
   END
```

Well, those were some of the things I learned about hatching. Then I began to wonder, "How many baby turtles can a mother turtle hatch at once?" Like a hero, I was determined to find out.

```
TO WORM
   REPEAT 10 (FD 4 RT 18)
   REPEAT 10 (FD 4 LT 18)

TO WORMY :X :Y
   SX :X SY :Y
   REPEAT 5 (WORM)
   END

TO CANOWORMS
   HT PC 2
   HATCH 1 WORMY 10 10
   HATCH 2 WORMY 10 20
   HATCH 3 WORMY 10 30
   HATCH 4 WORMY 10 40
   HATCH 5 WORMY 10 50
   HATCH 6 WORMY 10 60
   HATCH 7 WORMY 10 70
   HATCH 8 WORMY 10 80
   HATCH 9 WORMY 10 90
   HATCH 10 WORMY 10 100
   HATCH 11 WORMY 10 110
   HATCH 12 WORMY 10 120
   HATCH 13 WORMY 10 130
   HATCH 14 WORMY 10 140
   HATCH 15 WORMY 10 150
   HATCH 16 WORMY 10 160
   HATCH 17 WORMY 10 170
   WORMY 10 180
   END
```

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I discovered some interesting things. First of all, it seems that all the hatched turtles ignored my PC command. Only the mother turtle changed the pen color. Second, all the hatched turtles ignored my HT command. Strange! I thought perhaps the HATCH statement itself was cancelling the PC and HT. I figured, and then thought maybe I'd try to place the PC and HT within WORMY — that way they'd be called up right after every HATCH. So I changed WORMY, like so:

```
TO WORMY :X :Y
   HT PC 2
   SX :X SY :Y
   REPEAT 5 (WORM)
   END
```

I also discovered that the worms weren't moving all at once. Clearly they were moving in a sequence. To get a closer look at what was really going on, I slowed the whole thing down by placing a SLOW 100 command at the start of the CANOWORMS procedure. You try it. What I discovered, by running the whole thing very slowly, was that (correct me if my eyes are deceiving me) the way the Color Computer draws when hatching is to move quickly from the one little element of the subprocedure of one hatched turtle to one little element of the subprocedure of the next hatched turtle, drawing only a little at each stop. In other words, when the computer is running at top speed, it may appear as if all those hatched turtles are moving at the same time — but they aren't. That is an optical illusion. In reality, one hatched turtle moves a little bit, then the next hatched turtle moves a little bit, and so on, down the line.

Anyhow, I still hadn't found out exactly how many turtles could be hatched for one procedure. It seemed clear from my CANOWORMS procedure that at least 17 hatched turtles could work together, but how many more were possible? My little fingers were tired and so I decided not to test this any further. Lucky I didn't, too, because about a day later one of my spies told me I could have up to 254 hatched turtles! Wow! Just imagine the CANOWORMS I could have done, if I could have stood the typing!

But what really began to excite me was thinking about all the fancy procedures I had done in the past, and then thinking I could have my Color Computer do them with hatched turtles. One for instance will do:

```
TO FROST :N
   IF :N<2 (STOP)
   FD :N
   RT 45
   FROST (3*:N/4)
   LT 90
```

```
  FROST (3*:N/4
  RT 45
  BK :N
  END

TO SNOWFLAKE :N
  HATCH 1 FROST :N RT 45
  HATCH 2 FROST :N RT 45
  HATCH 3 FROST :N RT 45
  HATCH 4 FROST :N RT 45
  HATCH 5 FROST :N RT 45
  HATCH 6 FROST :N RT 45
  HATCH 7 FROST :N RT 45
  FROST :N
  END
```

That was great, if I do say so myself. Watching all those turtles moving at once made me think of bees, though. So I decided just for the sake of it to try a honeycomb.

```
TO HEXAGON
  REPEAT 6 (FD 10 RT 60)
  END

TO MORE
  REPEAT 6 (HEXAGON FD 10 LT 60)
  END

TO MOREMORE
  REPEAT 5 (MORE
  REPEAT 2 (FD 10 RT 60)
  FD 10 LT 180)
  END

TO HONEYCOMB
  HATCH 1 MOREMORE FD 10 LT 60
  HATCH 2 MOREMORE FD 10 LT 60
  HATCH 3 MOREMORE FD 10 LT 60
  HATCH 4 MOREMORE FD 10 LT 60
  HATCH 5 MOREMORE FD 10 LT 60
  PC 2
  MOREMORE
  END
```

I should confess immediately that I made a mistake when I first typed this up, and put a LT 120 at the bottom of MOREMORE, instead of LT 180. You might try that one, when you have a chance. It's not a honeycomb, but it sure is interesting.

Anyhow, I put the PC 2 in there just so we could know where the queen bee is at all times. Unfortunately, the queen kept being crowded out by her drones. That didn't seem realistic to me. After all, the queen is the boss. I wanted to say to the computer, "If any of the hatched turtles are near the mother turtle, make them turn and move in a different direction." In turtle talk, the instruction looked like this:

```
IF NEAR 0<20 (RT 120)
```

And I placed that instruction right in the earliest subprocedure:

```
TO HEXAGON
  IF NEAR 0<20 (RT 120)
  REPEAT 6 (FD 10 RT 60)
  END
```

You might be slightly familiar with the conditional IF statement because we used it before. The NEAR function refers to the distance between whatever hatched turtle is moving at the moment (the current turtle) and any designated turtle. In this case, the distance is 20 units (the added value of X and Y distances), between the current turtle and the designated turtle (turtle 0, the mother turtle). So I tried that one out with my honeycomb. The results were . . . interesting, and maybe they show you shouldn't fool with Mother Nature. But, I kept right on fooling. First, I tried reversing the less than sign (<) into a greater than sign (>). Next, I tried increasing the distance value in NEAR, to see if I could get the bees to spread out their honeycomb any further. Finally, I tried adding more hatched turtles, and changing some of the turn instructions.

Well, I know this is a shorter letter than usual, but to be truthful, I'm so excited about this hatch business I can't stand it. I'm going to go back and try everything with hatching! Maybe at last I'll produce some art that Ben approves of. In the meantime, I remain,

**Uncle Bert**

---

P.S. You can send your cards and letters to me in care of my good friend Dale Peterson. Just address them like this:

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c/o Dale Peterson
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# Designing A Video Monitor Output

**By Tony DiStefano**
***Rainbow* Contributing Editor**

*(Tony DiStefano is well known as an early specialist in Color Computer hardware projects. He is one of the acknowledged experts on the "insides" of CoCo.)*

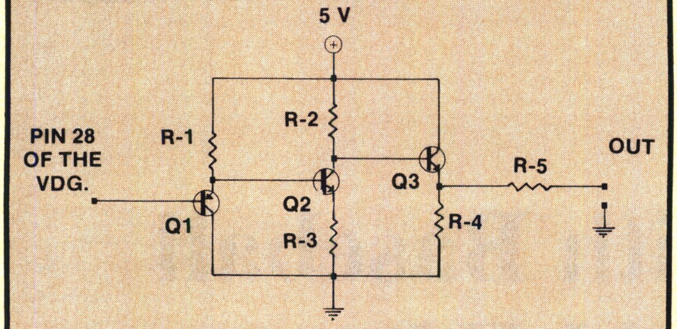
A few months ago, when I wrote the article on how to add a speaker to your CoCo, I mentioned that I was not going to do an article on a video monitor output for the CoCo. Well, I got a lot of letters and phone calls asking me to do one. The major complaint is that most of the monochrome (black and white) video outputs do not have enough gain to drive certain monitors. I thought this was quite strange because I had made one from a schematic in *the Rainbow* and did not have any trouble with gain. I always had plenty of brightness and good contrast with my Electrohome monitor. Well, just this week, I bought an Amdek 300A amber monitor, and guess what? My video monitor adapter did not have enough gain to drive this monitor properly. I thought there was something wrong with the monitor. I brought it back to the place I bought it and aired my complaint. They checked it out and told me that the monitor was okay and that my computer was not strong enough to drive this type monitor. It didn't take long before I took my video monitor adapter and threw it out the window. Now what was I to do? Humm! I guess I'll have to design my own.

What follows is what I designed as a video monitor output for the Color Computer. Following the schematic in Figure 1, you see a three stage amplifier. The first transistor is used as an impedence amplifier. The second transistor is an inverting voltage gain amplifier. The last transistor is used as an emitter follower. This adds the current gain necessary to drive monitors that are terminated with a 75 ohm load, just like the Amdek. It is not hard to construct this circuit. You will need all of the usual project tools like a soldering iron, pliers, cutters, screwdrivers and the like. Get all the parts in the parts list, though I think that most of you will have all of these parts in your junk bin. There is nothing hard to get, but do get all the right resistor values, close is not good enough. You can mount it on a piece of perf board like in the list, or you can mount it on just about anything. The output connection can be made in many ways. You can drill a hole in the back of your CoCo and install a chassis mount RCA connector — Radio Shack #274-346. If you don't want to drill a hole in your CoCo, just use a long wire with an RCA jack on the end, or whatever type terminator your monitor has. Most monitors have RCA terminators. You can mount the board inside the computer with double-sided tape on top of the RF adapter.

The .1 uf capacitor in the parts list does not show up on the schematic. This is a decoupling capacitor and goes from the +5 volt line to ground. This is only to eliminate noise generated from the power supply. This video monitor output will work on any CoCo version, it will even work on the CoCo 2.

Like usual, if you have some problems with my projects or modification, or if you have a good idea you would like to share with me, give me a call on any Monday night after 7 p.m. My telephone number is (514) 473-4910. If you want to write to me, do so. If you need a reply to a question, include a SASE. 'Till next time.

Figure 1



Parts List

| Number | Description | RS# |
|---|---|---|
| Q1 | MPS2907 PNP | 276-2023 |
| Q2,3 | MPS3904 NPN | 276-2016 |
| R1 | 470 OHMS ¼W | 271-1317 |
| R2 | 100 OHMS ¼W | 271-1311 |
| R3 | 27 OHMS ¼W | N/A |
| R4 | 220 OHMS | 271-1313 |
| R5 | 10 OHMS | 271-1301 |
| C1 | .1 UF 25V | 272-1069 |
| P1 | PERF BOARD | 276-162 |

## Submitting Material To the Rainbow

Contributions to *the RAINBOW* are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary, explaining how the program works. We're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, *the RAINBOW*, P.O. Box 209, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

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# Swinging With Baseball Interest Can Aid Educators

By Steve Blyn
*Rainbow* Contributing Editor

Computers beware! The baseball season is upon us. Many a child's interest has turned once again to America's other popular pastime.

What happened to all of the snow and ice? It seems like just yesterday all of the students were throwing snowballs and talking about the Winter Olympics. Now spring has suddenly arrived and the talk has changed to baseball once again.

As always, it is best to swing with the interests of the kids if you want to introduce something new to them. This is another good opportunity to learn or review a simple read-data program. Baseball, of course, has teams and this leads us to lists. List manipulation is a great introduction to data processing for beginners.

Fortunately, baseball lists change often during spring training and at the beginning of the season. This gives us a perfect time to show the students how learning about the computer can help them to keep their lists current.

At this point, we must confess that the staff of Computer Island consists overwhelmingly of New York Met fans. It is certainly hard for us to keep our baseball list current. We still cannot recover from or even understand the loss of Tom Seaver.

We will naturally illustrate this month's program using the New York Mets as our example. You may alter the data to any ball team you like. If you kids are on a Little League or school team, their list will certainly be more appropriate to your needs.

Let's start by first clearing some memory. Line 30 will *CLEAR 1000*. This will most likely be enough for our purposes and will also easily keep this program in the realm of 16K. A higher *CLEAR* number can be used if your lists are very extensive.

Next we will dimension our list. We can use any number that is greater than the possible total of players. This will free us from worrying later on about keeping count of the number of data entries. *DIM A$(50)* and *B$(50)* will keep us well beyond the limit of players, even on the Mets spring training roster. You may, of course, resort to a higher *DIM* number if you require it.

The players' names and their positions will be entered in *DATA* lines. The B$ represents the position. Familiar abbreviations were used. For example, 2B stands for second base and LF stands for left field. The A$ is the player's name.

The *DATA* is entered as A$,B$. You may put several pairs on any *DATA* line. A common mistake I have often observed is putting a comma at the end of a *DATA* line. This indicates to the computer that there is an extra entry on the line that you did not intend to create. A comma at the end of a line will therefore cause an unintended entry of a blank data statement.

The *DATA* lines are read on lines 60-100. Notice that the *DATA* need only be read once in this program. Many beginners feel that the *DATA* must be read each time a new search for players is made. Our computer is smart enough to remember what it read once and use the information over and over again for endless information-seeking purposes.

The very last *DATA* entry is *END,END*. This is done so that you do not have to keep track of the number of *DATA* entries. Line 60 tells the computer to look for 50 entries, but line 80 tells the computer to stop reading when it encounters the name END. If you wish to add additional players to your list, place new *DATA* lines before the line that says *DATA END,END*.

Line 150 asks for a baseball position. Line 200 will search out and print all of the players that play that position. If none are found, the counter "NN" will be zero and a "Sorry, None Found" message will be displayed.

There are many additions or options that could be included in this program. We allowed for an End or Escape key and an All players key. If 'E' is pressed for the position, the program will end. If 'A' is pressed, all of the players will be listed. If you have a printer, *PRINT#-2* can be added to lines 200 and 330 to get hard copies of your lists.

---

*(Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)*

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The main purpose of our program, of course, is to encourage the children to experiment and learn. It is fun for them to plan other options or ways of printing out the *DATA*. By manipulating the *DATA* in various ways, we hope that the kids begin to have a better understanding of databased programs.

250 . . . . . . . 225
END . . . . . . 200

**The listing:**

```
10 REM"BASEBALL TEAM DATA BASE"
20 REM"STEVE BLYN,COMPUTER ISLAN
D,NY,1984
30 CLEAR 1000
40 REM"WE CAN DIMENSION THE STRI
NGS WITH ANY AMOUNT GREATER THAN
 THE POSSIBLE NUMBER OF PLAYERS"
50 DIMA$(50),B$(50)
60 FOR T=1 TO 50
70 READ A$(T),B$(T)
80 IF A$(T)="END" THEN 120
90 REM"IF THE PLAYERS NAME IS RE
AD AS 'END' THEN THE COMPUTER ST
OPS READING THE DATA."
100 NEXT T
110 REM"SET THE COUNTER TO ZERO"
120 NN=0:CLS7:PRINT@5,"BASEBALL
POSITIONS";
130 SOUND175,2
140 PRINT@484,"'A' FOR ALL & 'E'
 TO END";
150 PRINT@96,"WHAT POSITION DO Y
OU WANT TO SEETHIS TIME...";:INP
UT PS$
160 IF PS$="E" THEN CLS:END
170 IF PS$="A" THEN 270
180 PRINT
190 FOR T= 1 TO 50
200 IF B$(T)=PS$ THEN PRINTA$(T)
,B$(T):NN=NN+1
210 NEXT
220 PRINT
230 IF NN=0 THEN PRINT"SORRY,NON
E FOUND."
240 PRINT@483,"PRESS ANY KEY TO
GO ON...";
250 AN$=INKEY$
260 IF AN$="" THEN 250 ELSE 110
270 REM"PRINTOUT OF ALL PLAYERS
ON THE TEAM"
280 CLS8
290 PRINT@6,"THE ENTIRE TEAM";
300 PRINT@64,"PRESS ANY KEY FOR
NEXT PLAYER"
310 PRINT
320 FOR T=1 TO 50
330 PRINT T;B$(T),A$(T)
340 EN$=INKEY$:IF EN$=""THEN 340
350 IF A$(T)="END" THEN 240
360 SOUND200,2
370 NEXTT
380 REM"THE DATA IS ENTERED AS P
LAYER'S NAME,PLAYERS POSITION."
390 REM" YOU MAY USE OUR MET PLA
YERS FOR PRACTICE OR ENTER YOUR
OWN FAVORITE TEAM'S MEMBERS."
400 DATA TOM SEAVER,P,DOUG SISK,
P,RUSTY STAUB,RF,JOHN STEARNS,C,
CRAIG SWAN,P,WALT TERRELL,P
410 DATA WALLY BACKMAN,SS,BOB BA
ILOR,2B,HUBIE BROOKS,3B,CARLOS D
IAZ,P,GEORGE FOSTER,LF,RON GARDE
NHIRE,SS
420 DATA BRIAN GILES,2B,TOM GORM
AN,P,DANNY HEAP,RF,RON HODGES,C,
SCOTT HOLMAN,P,MOOKIE WILSON,CF
430 DATA MIKE HOWARD,CF,DAVE KIN
GMAN,1B,TERRY LEACH,P,TIM LEARY,
P,ED LYNCH,P,JESSE OROSCO,P
440 DATA RICK OWNBEY,P,GARY RAJS
ICH,RF,RONN REYNOLDS,C
450 DATA JOSE OQUENDO,SS,KEITH H
ERNANDEZ,1B,JUNIOR ORTIZ,C,MARK
BRADLEY,RT,DARRYL STRAWBERRY,RF,
RON DARLING,P
460 REM "THE NEXT LINE IS DUMMY
DATA TO END THE READING OF THE D
ATA"
470 DATA END,END
```

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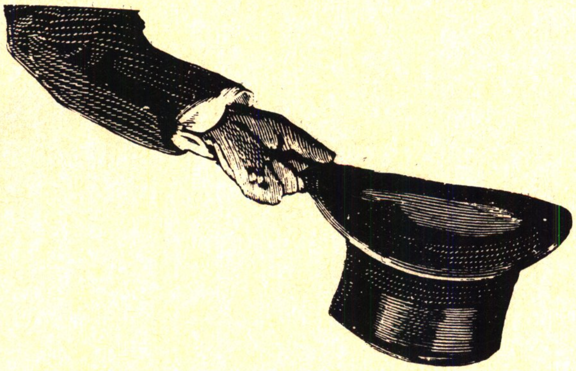

Nowadays, when you go to the theatre, you first pay your money and then go to the show ... and hope you enjoy it. But it wasn't always like that. Centuries ago it was the other way around. First you saw the show. Then the performers passed their hats around. If you enjoyed the show, you put money in the hat. The more you enjoyed it, the more you put in.

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|---|---|---|---|
| Checks SCRIPSIT (R) files | YES | YES | YES |
| Checks other text processor files | NO | YES | YES |
| Checks Basic data files | NO | YES | YES |
| Checks files larger than memory | NO | YES | YES |
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| Add words from dictionary | NO | YES | YES |
| Delete words from dictionary | NO | YES | YES |
| Custom dictionaries possible | NO | YES | YES |
| Comes with error-free dictionary | NO | YES | YES |
| Usable for foreign languages | NO | YES | YES |
| Checks and fixed in one pass | NO | NO | YES |
| Shows suspect words in context | YES | YES | YES |
| Usable with just one diskette | NO | YES | YES |
| Looks up words in dictionary | YES | NO | YES |
| Looks up words while correcting | NO | NO | YES |
| DIR command allowed during run | NO | YES | YES |
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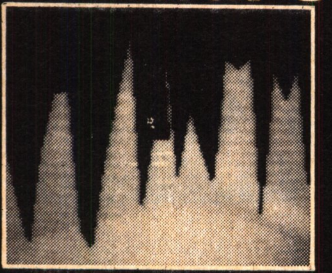

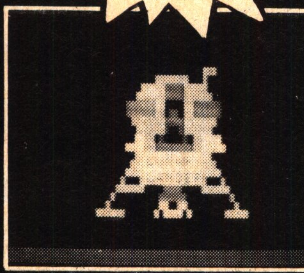

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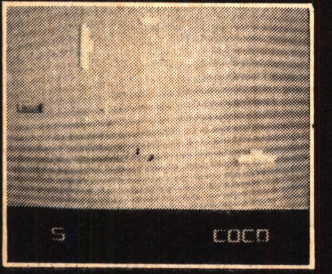

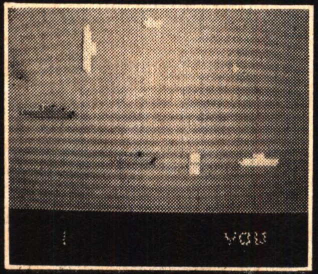

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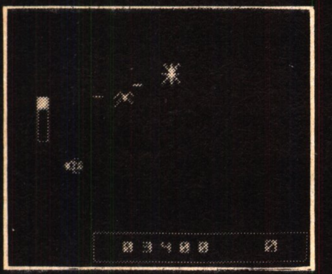

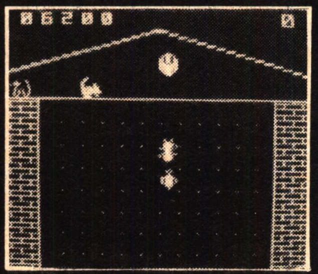

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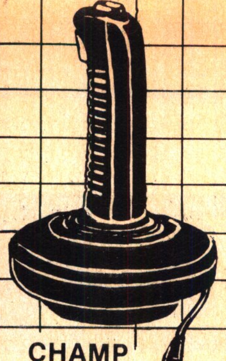

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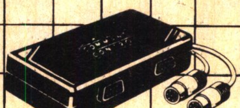

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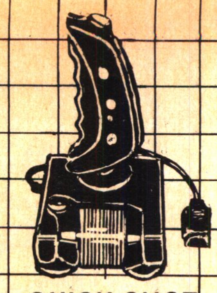

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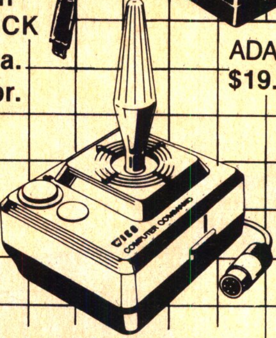

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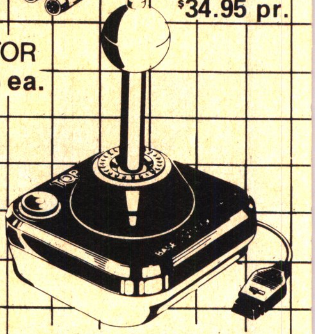

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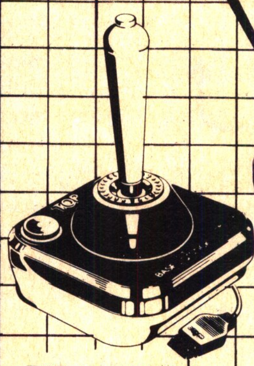

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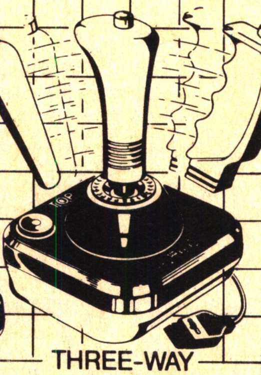

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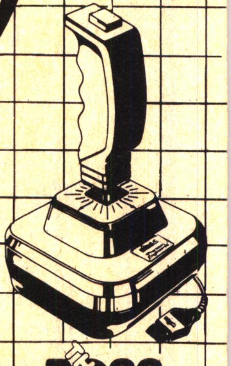

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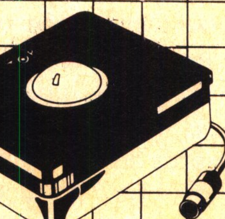

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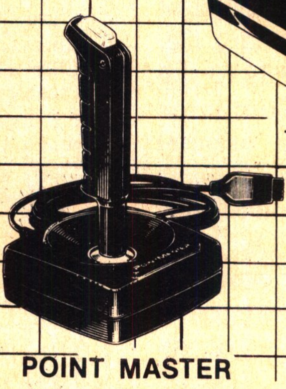

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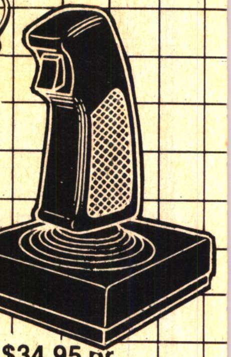

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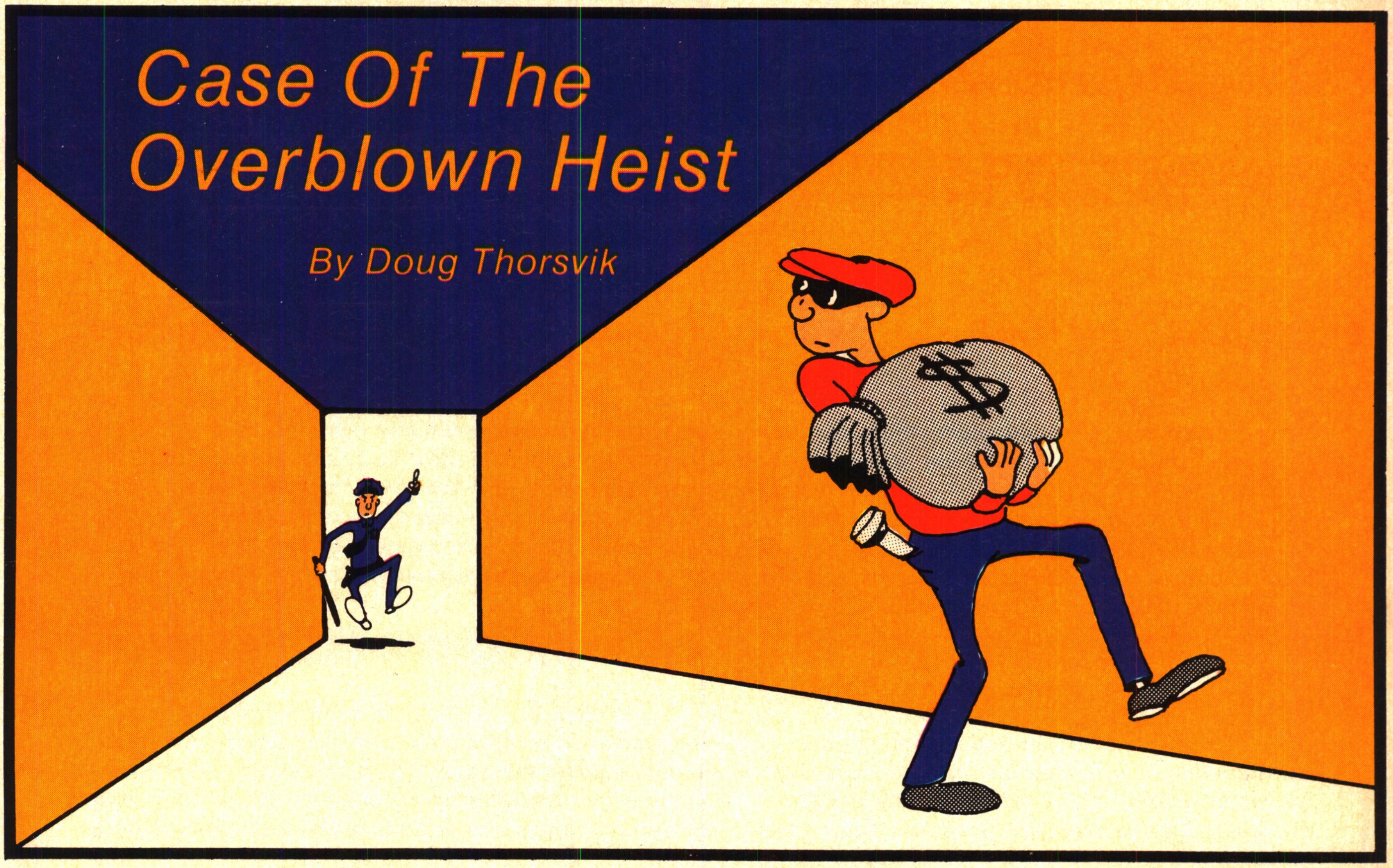
# Case Of The Overblown Heist

By Doug Thorsvik



Scenario: You're a bank robber and you've just blown your way into an underground vault. Unfortunately, you overestimated the amount of dynamite required; not only did you trap yourself in the vault, but the blast triggered the external alarm (the police are on their way). It did considerable structural damage. All but 15 moneybags are buried in the rubble and they scattered intact. The internal alarms (immediate detection and capture on contact) were also triggered. However, all is not lost; you have enough dynamite to easily blast your way free to the open exit, and since you're an enterprising soul (greedy), you're going to make the most of it and grab some moneybags as you blast your way through, hustling to get out before the police arrive.

Objective: Get out in time with as many moneybags as you can. You'll have to avoid the alarms as you blast your way, nonstop, through three screens to do it.

Instructions: Enter *PCLEAR6* before running the game. To move your player, use the four arrow keys. Diagonal moves are possible and so is continuous movement by holding down the arrow keys. To pick up the moneybags, run over them and avoid hitting the alarms. Use the space bar to blast. Be careful not to blow away any moneybags (or alarms for that matter). Pay attention to the yellow bar timer on the left — when it's gone, you are too! Hitting or blasting an alarm will get the same results. Exit each game screen through the opening in the bottom right-hand corner; you'll have to travel across three of them to get out. It will take some practice and considerable skill to get all 15 moneybags, but it can be done. When prompted for your initials, type in three letters only and they'll be displayed in the lower right-hand corner with the high score.

This game uses the speed-up poke when drawing the three game screens. If you don't want to use this poke, delete it from lines 1, 33 and 65. If you want more time to get out, change the ".6" in line 17 to a smaller number.

**Line Descriptions**

| | |
|---|---|
| 2 | Move game player |
| 3-7 | Blast routine |
| 8 | Hi-Res numbers routine |
| 9 | Hi-Res letters routine |
| 10 | Flip to a new screen and update score |
| 12 | Space bar pressed? |
| 13-16 | Poll keyboard for arrow keys |

---

*(Doug Thorsvik is a captain in the U.S. Air Force. He is presently an AFROTC instructor and teaches leadership and management at Washington State University and the University of Idaho.)*

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| | |
|---|---|
| 17 | Increment timer, time out? |
| 19 | Test to flip to a new screen, erase game player |
| 20 | Test and branch on detected color |
| 21 | Move game player |
| 22 | Get moneybag, increment score |
| 23-24 | Trip alarm |
| 25 | Successful completion prompt |
| 26-31 | High score routine |
| 32-33 | Play again routine |
| 34 | Erase text prompts |
| 35 | Title screen |
| 36 | Game sounds |
| 37-42 | Hi-Res letters and numbers |
| 43-49 | Game characters |
| 50-65 | Draw three game screens |

**A Brief Guide To Using The Hi-Res Letters/Numbers**

I've designed the graphic letters/numbers routines to be flexible and easy to use. If you want to use the graphics routines in your own programs, here's how to do it.

Lines 37-42 have to be run to initialize the graphics before the brief subroutines put them on the screen. Line 8 puts numbers on the screen and line 9 puts letters on.

Before using the subroutines you'll have to indicate some specifics:

Numbers: Presub info

ZN=number:Z1=x-coord:Z2=y-coord:Z5$=background color :Z6$=color of number:GOSUB8

(Z1 and Z2 must be *odd* numbers for the numbers to look right. The routine draws from right to left, thus, Z1,Z2 specifies the lower right corner of the number to be displayed. The width of the screen is the only limit of the size of the number. For an example, see line 22 in the listing.)

Letters: Presub info

ZL$=text (capital letters only) :Z1=x-coord :Z2=y-coord: ZC=color of text:GOSUB9

(Z1 must be *even* and Z2 must be *odd* for letter to look right. The routine draws from left to right, thus Z1,Z2 specifies the lower left corner of the text to be displayed. For an example, see line 27 in the listing.)

The explanation is brief, so you'll have to figure out the finer points on your own. This should give you a good start.

| | |
|---|---|
| 9 | 15 |
| 25 | 47 |
| 35 | 147 |
| 42 | 37 |
| 52 | 55 |
| END | 23 |

**The listing:**

```
0 'HEIST
1 POKE65495,0:GOSUB35:GOTO10
2 PUT(X,Y)-(X+13,Y+13),A5,PSET:X
=X1:Y=Y1:PUT(X,Y)-(X+13,Y+13),A0
,PSET:RETURN
3 IFX>18THENT=PPOINT(X-9,Y):IFT>
1THENPUT(X-14,Y)-(X-1,Y+13),A4,P
SET:IFT=4THEN23ELSEPLAYB$:PUT(X-
14,Y)-(X-1,Y+13),A5,PSET
4 IFY>14THENT=PPOINT(X,Y-1):IFT>
1THENPUT(X,Y-14)-(X+13,Y-1),A4,P
SET:IFT=4THEN23ELSEPLAYB$:PUT(X,
Y-14)-(X+13,Y-1),A5,PSET
5 IFX<228THENT=PPOINT(X+18,Y):IF
T>1THENPUT(X+14,Y)-(X+27,Y+13),A
4,PSET:IFT=4THEN23ELSEPLAYB$:PUT
(X+14,Y)-(X+27,Y+13),A5,PSET
6 IFY<154THENT=PPOINT(X,Y+18):IF
T>1THENPUT(X,Y+14)-(X+13,Y+27),A
4,PSET:IFT=4THEN23ELSEPLAYB$:PUT
(X,Y+14)-(X+13,Y+27),A5,PSET
7 GOTO13
8 ZA$=STR$(ZN):POKEZ3,Z1:POKEZ4,
Z2:FORZB=LEN(ZA$)TO2STEP-1:DRAWZ
5$+Z7$+"BR7"+Z6$+Z$(ASC(MID$(ZA$
,ZB,1)))+"BL3":NEXT:RETURN
9 POKEZ3,Z1:POKEZ4,Z2:COLORZC:FO
RZB=1TOLEN(ZL$):DRAWZ$(ASC(MID$(
ZL$,ZB,1)))+"BR3":NEXT:RETURN
10 PMODE1,PP:SCREEN1,0:ZN=S:Z1=7
9:Z2=191:GOSUB8:X1=18:Y1=0:X=18:
Y=0:GOSUB2:GOTO12
11 Y1=Y:X1=X
12 IFINKEY$=CHR$(32)THEN3
13 IFPEEK(341)=247THENY1=Y-14:GO
TO15
14 IFPEEK(342)=247THENY1=Y+14
15 IFPEEK(343)=247THENX1=X-14:GO
TO17
16 IFPEEK(344)=247THENX1=X+14
17 QQ=QQ+.6:LINE(0,0)-(2,QQ),PRE
SET,BF:IFQQ=>178THEN23
18 IFY1<0THEN11
19 IFX>228THENPP=PP+2:IFPP<7THEN
10ELSEGOSUB2:PUT(X,Y)-(X+13,Y+13
),A5,PSET:GOTO25
20 T=PPOINT(X1+7,Y1+7):ON T GOTO
21,22,11,23
21 GOSUB2:GOTO12
22 GOSUB2:PLAYMB$:S=S+100:ZN=S:Z
1=79:Z2=191:Z6$="C2":GOSUB8:GOTO
12
23 PUT(X,Y)-(X+13,Y+13),A5,PSET:
X=X1:Y=Y1:PUT(X,Y)-(X+13,Y+13),A
0,PSET:FORX=1TO10:SOUND180,2:SCR
EEN1,1:SOUND180,2:SCREEN1,0:NEXT
X
24 GOSUB34:ZL$="YOU GOT CAUGHT":
Z1=66:Z2=81:GOSUB9:ZL$="WITH":Z1
=116:Z2=93:GOSUB9:ZN=S:Z1=105:Z2
=105:Z6$="C2":GOSUB8:ZL$="DOLLAR
S":Z1=122:Z2=105:GOSUB9:FORD=1TO
1000:NEXTD:GOTO32
25 GOSUB34:ZL$="YOU MADE IT OUT"
:Z1=66:Z2=81:GOSUB9:ZL$="WITH":Z
1=116:Z2=93:GOSUB9:ZN=S:Z1=105:Z
2=105:Z6$="C2":GOSUB8:ZL$="DOLLA
RS":Z1=122:Z2=105:GOSUB9:FORB=1T
O1000:NEXTB
```

```
26 IFS<=HS THEN32ELSEHS=S:ZN=HS:
Z1=221:Z2=191:GOSUB8:ZL$=W$:Z1=2
22:Z2=191:ZC=1:GOSUB9:W$="":GOSU
B34
27 ZL$="NEW HIGH SCORE":Z1=66:Z2
=83:ZC=2:GOSUB9:ZL$="TYPE YOUR I
NITIALS":Z1=50:Z2=97:GOSUB9
28 FORB=1TO3
29 Q$=INKEY$:IFQ$=""THEN29
30 W$=W$+Q$:NEXTB
31 ZL$=W$:Z1=222:Z2=191:ZC=3:GOS
UB9
32 GOSUB34:ZL$="TO PLAY AGAIN":Z
1=70:Z2=83:ZC=4:GOSUB9:ZL$="PRES
S SPACE BAR":Z1=60:Z2=97:GOSUB9
33 IFINKEY$<>CHR$(32)THEN33ELSEG
OSUB34:POKE65495,0:GOSUB50:GOTO1
0
34 LINE(46,71)-(226,110),PRESET,
BF:RETURN
35 CLS:PRINT@140,"*HEIST*":PRINT
@197,"COLOR COMPUTER VERSION":PR
INT@264,"BY DOUG THORSVIK":PRINT
@388,"20 SECONDS ARE REQUIRED":P
RINT@420,"TO SET UP 3 GAME SCREE
NS"
36 D=13:E=14:HS=500:B$="V30L8T56
;O1;1;4;7;10":MB$="L8T224O5;1;5;
9;O3;1;5;9;O1;1;5;9":W$="DRT":Z5
$="C1"
37 DIMZ$(90):Z3=200:Z4=202:FORZB
=48TO57:READZ$(ZB):NEXT:FORZB=65
TO90:READZ$(ZB):NEXT
38 DATA"U8L5D4L2U5D9NR4","H3U5L3
RD8NR3L2","L7E6UHNL5DG5D2","U2H2
UEU2NL6G3DF4L7","U9D4L7UNE3DR4D5
BL4","BU2H6NR6D3RF3D2L5","BU2U2H
2UEL2G4DR2UD4NR2BL2","BL4U3E4UNL
7LG6D2","U8L5D3R2D5L4NU9","BL5E5
UH3ND5LG3DF2DG2
39 DATA"NU9R3U2NR2U6R4D8","NU9R3
U8R4DG2DF2D2NL3","NU9R3U9R4D3BD3
D3NL3","NU9R3U9RF3D3G3BR3","U9R3
NR4D4NRD5R4","U9R3NR4D4NRD5BR4",
"U9R7BD4NL2D5NL4","U9R3D9U4R4U5D
9","R2U8NLR4LD8R2","NU5R4U9R3D9"
,"NU9R3U9D6E3NU3GDF2D2","U9R3D9R
4","U9F5D2NH3UE4U2NG3D9
40 DATA"U9F7NU7D2NH5","U9R2ND5R5
D9NL5","U8R6D3L3UD6BR4","U9R7D4G
4ERF2","NU9R3U8R4DG2DF2D2","R4U5
LNUL3U4R7BD4D5","BR2U8LR5LD8BR2"
,"U8R3D8R4NU8","BU2U7R3D9RU3R3NU
6BD3","NU8E5U2NG3LNF3D2F5NU8","N
U3NR3E6NU3GLH4ND3NR3F7D2","BU4U5
R3D9R2U4R2NU5BD4
41 DATA"E7UNL7LG6D2R7
42 Z7$="U8L3D8L2U8L2D8":Z$(32)="
```

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```
BR5"
43 DIMA0(2),A1(2),A2(2),A3(2),A4
(2),A5(2),N(15)
44 PMODE1,1:PCLS:SCREEN0,0:GET(0
,0)-(13,13),A5,G
45 DRAW"BM0,0C3BR2R9G3L4G2R9F2L1
3D2R12G2L7F2R4BL2C2H3R4U4L3U3R4H
3":GET(0,0)-(13,13),A1,G:PCLS
46 DRAW"BM0,0C4BD5RFHLE4UND7F4NL
6DG6NR5GR8E4U6":GET(0,0)-(13,13)
,A2,G:PCLS
47 DRAW"BM0,0C3BR4R5G4L2NG3R8NEG
9R2U7NR2F7L3U7":GET(0,0)-(13,13)
,A0,G:PCLS
48 DRAW"C3BM0,0ND13R6ND13R7D6NL1
1D7L11":GET(0,0)-(13,13),A3,G:PC
LS
49 DRAW"C4BM0,0BD6R3EUNHRERNU3FR
NEDFDNR3GDNFLGLND3HLNG":GET(0,0)
-(13,13),A4,G:PCLS
50 L=15:BB=0:PP=1:QQ=0:S=0:XX=1:
X1=18:Y1=0:X=18:Y=18:FORB=1TO5ST
EP2:PMODE1,B:SCREEN0,0:PCLS:NEXT
B
51 PMODE1,1:SCREEN0,0:FORB=60TO2
42STEP14:PUT(B,0)-(B+13,13),A3,P
SET:NEXT:FORB=4TO242STEP14:PUT(B
,168)-(B+13,181),A3,PSET:NEXT
52 FORB=0TO154STEP14:PUT(4,B)-(1
7,B+13),A3,PSET:NEXT:FORB=14TO11
2STEP14:PUT(242,B)-(255,B+13),A3
,PSET:NEXT
53 ZL$="HIGH SCORE":Z1=84:Z2=191
:ZC=4:GOSUB9:ZN=HS:Z1=221:Z2=191
:Z6$="C2":GOSUB8
54 ZL$=W$:Z1=222:Z2=191:ZC=3:GOS
UB9:ZL$="LOOT":Z1=0:Z2=191:ZC=4:
GOSUB9:COLOR2:LINE(0,0)-(2,178),
PSET,BF
55 PCOPY1TO3:PCOPY2TO4:PCOPY3TO5
:PCOPY4TO6
56 FORX=1TO15:N(X)=X:NEXTX
57 FORP=1TO5STEP2
58 BB=BB+5:XX=XX+2
59 PMODE1,P:SCREEN0,0
60 FORB2=14TO154STEP14:FORB=18TO
228STEP14:B3=RND(2)-1:IFB3=1THEN
PUT(B,B2)-(B+13,B2+13),A3,PSET
61 NEXTB,B2
62 FORB=1TOBB:C=RND(15)*14:C2=RN
D(10)*14:PUT(18+C,14+C2)-(31+C,2
7+C2),A2,PSET:NEXTB
63 FORX=1TOXX:R=RND(L):T=N(R):N(
R)=N(L):L=L-1:C=T*14:C2=RND(10)*
14:PUT(18+C,14+C2)-(31+C,27+C2),
A1,PSET:NEXTX
64 NEXTP
65 POKE65494,0:RETURN
```

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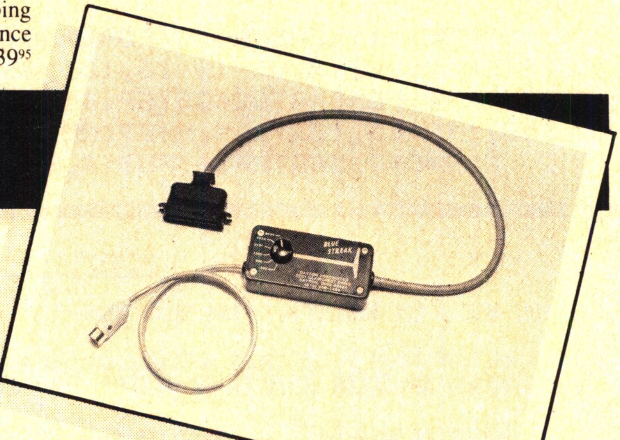

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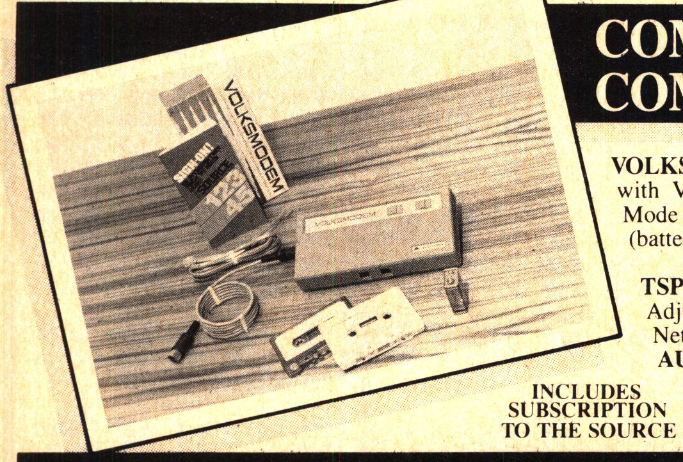

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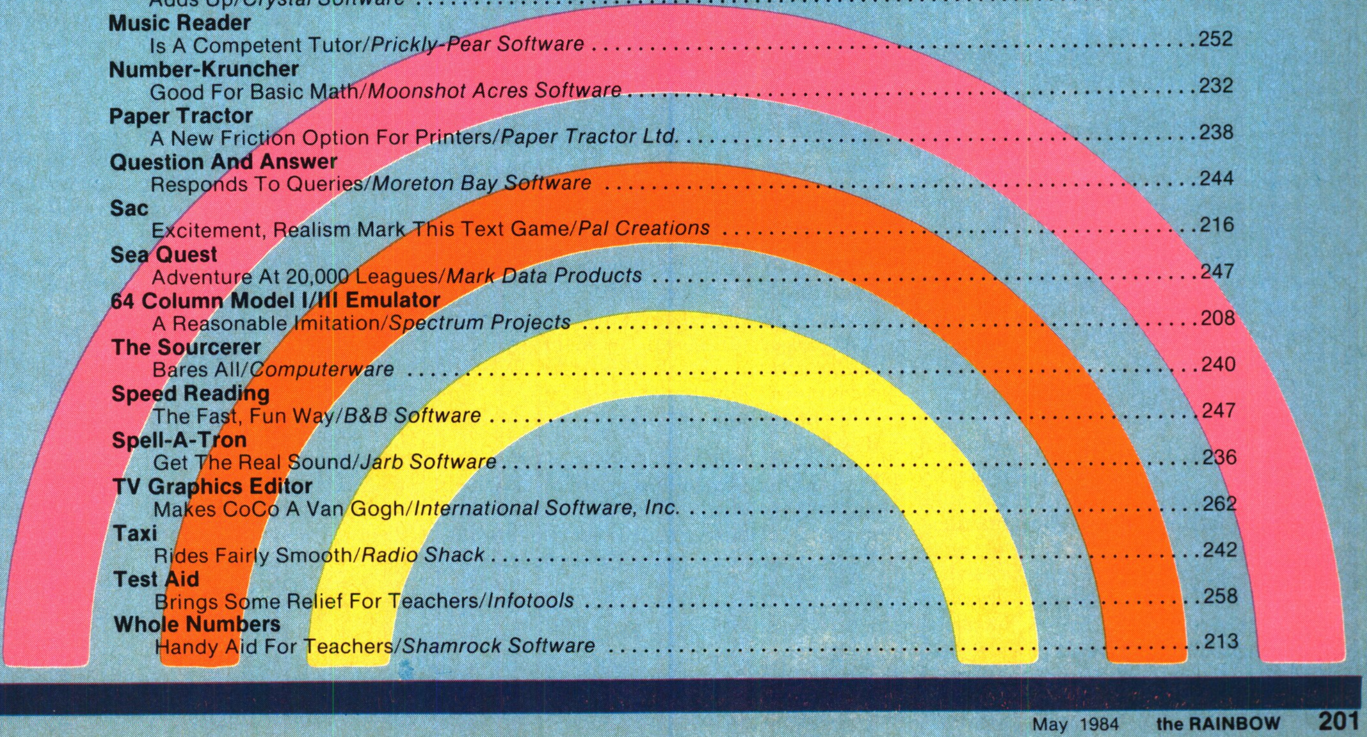

# RECEIVED & CERTIFIED

**The following products recently have been received by *the Rainbow*, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be.**

**This month the *Seal of Certification* has been issued to:**

**The Adventure Generator**, a 32/64K ECB full-featured Adventure game generating program. Write a ready-to-run Adventure game by entering your own inputs. All you need to do is map out the Adventure you wish to generate and enter the room descriptions, commands, objects and conditional flags as you want them to be used. Jarb Software, 1636 D Ave., Suite C, National City, CA 92050, tape $34.95

**Address One**, a 16K ECB program which maintains address files and related information. The menu includes: Opening a new file; adding a record; completing label sets; selecting label sets, editing a record; exiting to BASIC, and help and information. West Bay Co., Route 1, Box 666, White Stone, VA 22578, $20

**Alpha-Dir**, a 16K ECB program which helps arrange your disk directory(ies) in an alphabetical order. It keeps your disks in order and allows easy access to your programs. This program automatically arranges granules, files type and ASCII flag for all your programs. Microcom Software, P.O. Box 214, Fairport, NY 14450, cassette $6.95, disk $14.95

**Calixto Island,** a Hi-Res 32K graphic Adventure game. Visit the recreation of the classic Calixto Island. Travel through a secret laboratory, a Mayan pyramid and meet crazy Trader Jack. Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, tape $19.95

**Candy Co.**, a 32K ML arcade action game. You control the hero, Candy Dan, around the Candy Co. on moving conveyor belts. In this maze game, you must pick up all the candy on the conveyor belts in each frame while successfully outsmarting the bad guys and saving Q.P. Doll. Over 1,000 frames of increasing difficulty. Hi-Res graphics, sound effects, joystick or keyboard input, pause feature, eight digit score and high score name entry. Intracolor, P.O. Box 1035, East Lansing, MI 48823, tape and disk $34.95

**Car Manager**, a 16K ECB program which will compute your vehicle miles per gallon and the cost of operating your car per mile, along with total costs for gasoline, maintenance and repairs. All data can be saved to tape or disk to be updated for more recent computations. Records printed to the screen or optional printer. 80 Custom Software, 5720 Brooke Lane, Sylvania, OH 43560, tape $12.95, disk $15.95

**Castle Ragoona**, a 16K non-ECB Adventure. Explore the castle by making your way through a dark and mysterious maze of passageways, conquering evil monsters in your path, and finally climb the tower and raise your flag to signify victory. Tape also includes **Enchanted Village**, a 16K non-ECB beginner's Adventure. Walk through town and collect objects, but watch out for the pirate who will try to steal them away from you. Included is a graphic display of your location in the village and a compass showing directions. Family Computers, 4047 Bee Ridge Rd., Sarasota, FL 33582, tape $19.95

**CGP-115 Screen Dump**, prints screen images on the Radio Shack CGP-115 or TDP Color Graphic Printer 1. Derby City Software, 3141 Doreen Way, Louisville, KY 40220, $19.95

**CoCo Cookbook**, a 32K, one disk drive program designed to store and retrieve recipes. Generally, it is a free-form database manager that has been optimized for the storage of any type information. Store up to 269 recipes and each can be recalled by storage number or keyword search. Computerware, P.O. Box 668, Encinitas, CA 92024, $27.95

**CoCo Serial/Parallel Interface**, an interface which provides switch selectable printer or modem operations. It features switchable Baud rates from 300 to 9600 and comes complete with power supply, modem cable and Centronics-type printer cable. PBH Computer Products, Inc., P.O. Drawer 55868, Houston, TX 77055, $89.95

**Disk Dump/Patch Utility**, a program that manipulates disk data. Data can be read from any track/sector or granule/offset. The limit is in the number of tracks on your disk, 35, 40, 96, etc. Data is viewed 128 bytes at a time in both hexadecimal and ASCII formats. The data from a disk sector can be scrolled up or down by eight bytes or scanned forward and backward by 128 bytes. Silicon Rainbow Products, 1111 W. El Camino Real, Suite 109, Sunnyvale, CA 94087, disk $22

**Disk Editor/Assembler**, a disk version of *EDTASM+* with a number of added commands. Includes both 16K and 32K versions. Radio Shack stores nationwide, cat. no. 26-3254, $59.95

**Disk Fix and OS-9 Utilities**, supports double sided/double density, 40 tracks and step rates of up to six ms. (over 368,000 bytes per drive). Each drive is separately configured, allowing any drive combination. Computerware, Box 668, Encinitas, CA 92024, $29.95

**Easy To Understand Guide To Home Computers**, a complete source for personal computer buying information. It cuts through the technical talk to tell you clearly what computers are, how they work, and why they are so useful. This book tells you about the many ways you can use a computer as a tool to plan your budget, analyze investments, type letters, keep records, play games, etc. Consumer Guide, 3841 W. Oakton St., Skokie, IL 60076, $3.98

**Education #1**, a 16K educational package containing seven programs aimed at any age group from the very young through college-bound students. It includes: *Words* — Unscramble up to six-letter words in the time allotted; *Spellit* — Out of random lists of five words, pick out and spell the misspelled word; *Learn Notes* — Learn the notes on a piano keyboard; *Sorts* — Lists and demonstrates four common sorts; *Base Guess* — You pick the base the computer picks the number and guess it; *Morse Quiz* — Learn Morse Code by the alphabet, then words, and finally sentences; and *Equations* — Solves simultaneous equations using matrix inversions. SilverWare, P.O. Box 21101, Santa Barbara, CA 93121, tape $18.95, disk $21.95

**Educations #2**, a 16K, nine-program educational package for the young through college-bound students. It includes: *Mathvaders* — Shoot the correct answer; *Scrambler* — Put lists of items in order and create your own lists; *Language Drill* — Learn foreign words; *Factors* — Pick high numbers with no or low factors to beat your opponent; *Typing Tutor* — Learn or improve your typing skills; *Manybody* — Give up to nine bodies mass, direction and velocity to see, graphically, how gravity affects them; *Maximum* — Pick the largest number in your column to give your opponent the lowest picks in his row; *Chemlab* — Simulates five different chemistry experiments; and *How Far* — Shows the distance and direction of any points on earth. Use coordinates of the predefined cities. SilverWare, P.O. Box 21101, Santa Barbara, CA 93121, tape $18.95, disk $21.95

**E.T.T. (Electronic Typing Teacher)**, a 16K ECB program which helps you learn to type the right way, saving you hours of tedious work when entering programs into the CoCo. *E.T.T.'s* video keyboard lets you practice with all the keys labeled, all the keys blank or only the "home" keys labeled. There are over 1,000 sentence variations which include every letter of the alphabet. CoCo Warehouse, 500 N. Dobson, Westland, MI 48185, tape $21.95

**Everyone's Guide To BASIC**, an easy-to-understand book which explains the uses of the essential commands in the BASIC language. Easy exercises give you practice using commands. And you'll see how BASIC commands work together in simple, practical computer programs. Consumer Guide, 3841 W. Oakton St., Skokie, IL 60076, $4.98

**Fastdupe**, a 64K ECB, ML utility requiring one or more disk drives. It will read your master diskette (standard format) containing up to 20 granules (46,080 bytes) of information; format the blank disks; make up to four backups (depending on how many drives are available) in a single pass, and repeat the duplication process as many times as requested. Spectrum Projects, 93-15 86th Dr., P.O. Box 21272, Woodhaven, NY 11421, disk $19.95

**Finanal**, a 16K ECB financial analysis program for construction contractors. It provides the contractor with a point in time financial snapshot of all current jobs and a view of overall results. The program provides a detailed analysis on a 19-column spreadsheet. The results may be plugged into the contractors balance sheet. Requires a line printer. David Sligar Software, 7091 Pickway Dr., Cincinnati, OH 45238, tape $49.95

**Gold Plug-80**, a plug which eliminates disk reboots and data loss due to oxidized contacts at the card edge connectors. It solders to the board edge connector. E.A.P. Co., P.O. Box 14, Keller, TX 76248, CoCo disk module (2) $16.95, disk drives (all R.S.) $7.95, gold disk cable 2 drive $29.95, four drive cable $39.95

**Graphic Math Adventure**, a 32K ECB Adventure (an enhanced version). Fully player selectable with up to 300 rooms. Search for treasure on land, river and in the labyrinth of caves. Your search is blocked by many obstacles which can be overcome by correctly answering math problems. Any one or all four functions (addition, subtraction, multiplication and division) can be selected to add variety. Also has 24 skill levels. Software Factory, 1333 Morgan Rd., Bremerton, WA 98312, tape $21.95

**The Gunfighter**, a 32K Hi-Res arcade game requiring two players and joysticks. You are the top gun in the territory, and life is just great, until the kid rides into town. Who will prevail in the western drama? Only you and your opponent can decide that issue. Can you not only outdraw your challenger, but shoot straighter than he can? Will you be able to dodge the blazing bullets aimed at your heart? Jarb Software, 1636 D Ave., Suite C, National City, CA 92050, tape $24.95

**Hide-A-Basic**, a 16K ECB program used to protect your own BASIC programs. It will create up to four machine language routines which can be called from your own BASIC programs to disable the [BREAK] key, *LIST* command and [RESET] button. This program will also create a special error-skip routine which can be used to trap errors, adding a double protection to the programs. Microcom Software, P.O. Box 214, Fairport, NY 14450, tape $16.95

**Ice Bird**, a 16K strategy arcade game in which a player assumes the role of a penguin in a maze of ice blocks. It has the ability to push or shatter these frozen blocks with ease. Your goal is to connect three diamond blocks without getting stung and defend yourself from stinging pursuers by crumbling their hatching blocks or by sliding ice blocks at them as they move about the maze. Crystal Software, 6591 Dawsey Rd., Rock Creek, OH 44084, $24.95

**Ice Hockey**, a 32K Hi-Res ice hockey game. Race against the computer or an opponent in this Hi-Res game. Includes a real time clock similar to the NHL. Many skill levels too. Also requires a joystick for each player. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, disk $27.95

**Instructional Computing With The TRS-80** by Herbert Nickles and George Culp, a text consisting of nine chapters that describe an approach to using a common computer language — BASIC. It discusses certain fundamentals of the language and the design and development processes that provide a foundation for the production of instructional computing programs. Brooks/Cole Publishing Co., Monterey, CA 93940, $16.95

**Lost World Pinball**, a pinball game for the 16K Micro Color Computer. Maneuver the ball around the volcano, dinosaurs, a prehistoric fly, etc., and try to hit any red objects such as bumpers, plungers, red marks and red power strips. Radio Shack stores nationwide, cat. no. 26-3363, $9.95

**Math Design**, a two-program math package for the Micro Color Computer. *MiniCalc* functions like a hand-held calculator. You can perform a wide range of mathematical functions with this program. *Spirals* is a geometric exercise which lets you design and plot a large variety of polygonal spirals in four colors. Use your imagination to plot shapes and designs. Radio Shack stores nationwide, cat. no. 26-3362, $9.95

**MENUWRTR**, a program designed to assist the programmer in the development of menu-driven screens (or other alphanumeric and/or semi-graphic screens). The programmer can design up to nine screens which can be called via BASIC's USR function. The ML screen driver routine can be saved to tape along with the programmer's own screens to be used later with the BASIC program for which the screens were designed. Glasby Software, P.O. Box 977, Easley, SC 29640, $24.95

**Morse Code Teacher**, a 16K ECB program that teaches Morse code letters and numbers. It gives practice of up to five words per minute. Cynwyn, 4791 Broadway, Suite 2F, New York, NY 10034, tape $15

**Morse Code Tutor**, a 16K ECB program that gives code practice up to 27 words per minute, Cynwyn, 4791 Broadway, Suite 2F, New York, NY 10034, tape $15

**Mr. Dig**, a game in which you must dig through cherry groves while avoiding enemies such as "meanies." Score points by eating cherries, capturing a diamond and squashing meanies with apples and the power orb. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, tape $27.95, disk $30.95

**MSI Color Calendar**, a 32K disk program that enables you to maintain special dates, appointments, payments, etc. Program allows for recurring payments with only one entry. Monthly calendars can be printed or displayed with special date reminders. Delker Electronics Inc., Sam Davis Rd., Smyrna, TN 37167, $19.95

**Mul-T-Screen**, a high-resolution screen program, provides character display modes ranging from 8-by-4 to 42-by-24 and 32-by-32. Includes sample programs. Incentive Software, Box 323, Station B, London, Ontario N6A 4W1, $24.95 tape, $27.95 disk

**Option II**, a payroll journal requiring 64K. It totals all expenses by category, sort/view by checks/payee, totals expenses by selection, etc. YGS, P.O. Box 208, Brechin, Ontario L0K 1B0, $49.95

**Personal Computing BASIC Programming on the TRS-80**, a book designed primarily for readers who have had little or no experience in programming computers and who wish to acquire a good working knowledge of computer programming in the BASIC language. Brooks/Cole Publishing Co., Monterey, CA 93940, $15.95

**Piratector**, a 32K program designed to protect disk-based software written for the CoCo and compatible systems from piracy. In addition, it has many other features to enhance the software you develop and will aid in duplicating your software if you have more than one disk drive. To make a title screen you should have *Semigraf*, which is included. Sugar Software, 2153 Leah Lane, Reynoldsburg, OH 43068, $99.95

**SCRIPT+**, a 32K ECB spelling program with *PMODE3* "handwriting" in three display modes of eight- or 16-character words with diagraphs. Words, containing up to 16, can be entered from the keyboard or from a cassette recorder. Lesson duration, two computer speeds and two display sizes are selectable and with results of a lesson can be printed or saved to cassette. Cancoco Software, P.O. Box 2914, Medley AB, Canada T0A 2M0, tape Can. U.S. $17.50

**Sea Quest**, a 32K Hi-Res Adventure game which takes you on an underwater treasure hunt. Get your shark repellant and scuba tanks ready! Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, tape $24.95, disk $27.95

**The Sourcerer**, a source generator for the 6809 microprocessor. It is written in position independent code and is just over 6.5K bytes long. It requires the OS-9 operating system and at least one disk drive. It produces symbolic source codes that can be assembled. Also features automatic equate generation for labels and symbols outside of disassembly range. Computerware, Box 668, Encinitas, CA 92024, tape $34.95, disk $39.95

**Speed Math**, a 16K ECB program for gaming and practicing with the simple mathematics of addition, subtraction, multiplication and division. You can have 10 to 100 problems and pick the difficulty level. West Bay Co., Route 1, Box 666, White Stone, VA 22578, $8

**Spit-N-Image**, a machine language disk backup utility program for the 32K or 64K CoCo. It's purpose is to allow backups of most CoCo disks that will not respond to normal backup or copy operations. Computize Inc., P.O. Box 207, Langhorne, PA 19047, tape $24.95

**Subtraction Drill**, a 32K ECB program for kindergarten through fourth grade designed to be used individually or with large groups, auto run and menu driven in 10 levels of sequential facts and random facts. Computer displays correct answer after two misses. Erase and quiet options, rewards provided. CY-BURNET-ICS, 5705 Chesswood Dr., Knoxville, TN 37912, $24.95

**Super Color Biorythms**, a 16K ECB Hi-Res graphics program that graphs the biorythms physical, emotional, and intellectual cycles of any person, place, or thing. Armadillo International Software, P.O. Box 7661, Austin, TX 78712, tape $19.95 plus $2.50 S/H

**Super Edit**, a line oriented editor for use in editing BASIC programs on the CoCo. It is more powerful than the editor supplied with Extended Color BASIC and is written in assembly language. It resides in memory with the BASIC program and is transparent to the operating system. The Dataman, Box 431, Sta. B, Hamilton, Ontario, Canada L8L 7W2, U.S. $16.95, Canadian $19.95

**Teacher's Pet**, a 32K ML disk program which features 40 students per file, four terms with up to nine tests per term, alphabetical order, letter grades, numeric grades, year-end reports, search, delete, add, screen and printer output, enter classes and grades any time of the year. Aurora Software, 49 Brookland Ave., Aurora, Ontario, L4G 2H6, disk $34.95

**Things To Do With Your TRS-80 Color Computer**, by Jerry Willis, Merl Miller and D. LaMont Johnson, a guide to currently available hardware and software for the TRS-80 Color Computer. It includes prices and ratings on: video games; music and art programs; the computer as a teacher; programming and computer languages; telecommunications and networking; business applications; and much more. This book covers both the 16K and 64K models. The New American Library, Inc., 1633 Broadway, New York, NY 10019, U.S. $3.95, Canadian $4.95

**Time Fighter**, a 16K machine language game. Pilot your MD-64 space fighter through a hazardous time tunnel to destroy the dreaded Time Guardian who threatens the natural order of the universe. You must overcome aerial dangers, time zones, navigate invisible mine fields and refuel from a moving supply ship. Mark Data Products, 24001 Alicia Pkwy., No. 207, Mission Viejo, CA 92691, tape $24.95, disk $27.95

**Triple Transfer Utility**, a machine language backup utility program for the 32K or 64K CoCo with one or more disk drives. Its purpose is to allow the transfer of most CoCo ML, BASIC, and *DATA* files from tape to disk and disk to tape with relocation of most ML programs that interfere with the disk operating system. Computize Inc., P.O. Box 207, Langhorne, PA 19047, tape $19.95

**The TRS-80 User's Encyclopedia**, a complete ready reference book for the TRS-80 CoCo owner. This book will answer your questions, give you "inside" information, and greatly increase your use and enjoyment of your computer. It explains programming languages, including BASIC; guides you through DOS, ASCII, FLEX; simplifies operating procedures; describes hundreds of software and hardware packages and accessories; lists publications, users' groups, and other information sources. Continental Software, 5251 W. Imperial Highway, Los Angeles, CA 90045, $14.95

**TS6551 RS-232 Serial Interface**, a programmable RS-232-type serial interface for connecting the CoCo to modems, printers, terminals, etc. This device frees your printer while providing a second serial port with extended features. It provides eight signals commonly used in RS-232 communications with a modem: GND, RND, DTR, DSR, RTS, CTS and DCD. It can also generate interrupts on either a received character or a data carrier detection. T & S Electronics, 6111 Romany Dr., San Diego, CA 92120, $59.95 introductory offer ($10 off advertised price)

**TS6821 Centronics Interface**, a parallel printer interface pack which provides a Centronics compatible interface for connecting your CoCo or CoCo2 to a parallel printer. Unlike other parallel interfaces which operate through the serial port, the TS6821 plugs directly into the CoCo expansion port or the multi-pak interface. T & S Electronics, 6111 Romany Dr., San Diego, CA 92120, $49.95

**T.UTIL**, a tape utility designed for use by the home computer hobbyist. It provides tape management functions which help organize the home tape library. The *INDEX* command provides a complete record of the file content of a tape. Additionally, there are commands for appending, reading, writing, and copying tape files. Sadre Software, P.O. Box 3891, Gaithersburg, MD 20878, $12.95

**29 Monsters**, a text-only 16K Extended BASIC Adventure program. You are trapped in the evil wizard's castle. To gain your freedom, you must pass through 29 rooms, each one guarded by a hideous monster who will only let you pass if you can devise the correct password based on whether your answer is right or wrong, and if you are wrong, you will be set back along with your escape route. B&B Software, P.O. Box 210, Jenkintown, PA 19046, tape $14.95

**The *Seal of Certification* program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in *the Rainbow*. By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to *the Rainbow's* reviewers for evaluation.**

**— Susan Remini**

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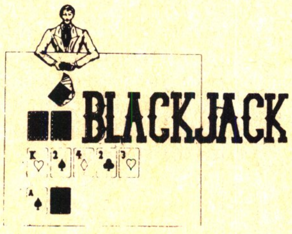

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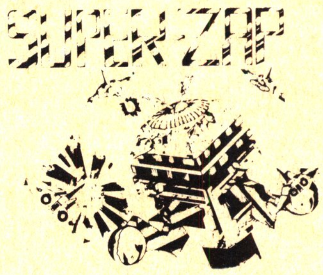

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**BOWLING SCORED FOR DOLLARS** - Do your leagues bowling averages. This program will keep individual scores, team totals, individual averages, team standings, and print all this information to your line printer. On cassette and disk, specify on order. Only $\$19^{95}$.

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### MANSION OF DOOM

*Editor:*

As a co-author of *Mansion of Doom*, I would like to respond to Mr. Paul Gani's review of our Adventure program on Page 230 of the February 1984 *Rainbow*.

Overall, his review was a fair (although muddled) appraisal of this fine Adventure program. However, some points need clarification:

All Pal Creations Adventures have the verb vocabulary built into the program to make it easier for the Adventurer to get used to the verbs used in that particular program. If Mr. Gani kept using TAKE instead of the accepted word GET, then I'd say he has a personal semantic flexibility problem. Other Adventurers have had no problem getting used to the verb vocabulary, especially since the program tells you all the allowed verbs if you use a wrong one.

All Pal Creations Adventures have the instructions built into the program in order to minimize constant referring back-and-forth between the program and a piece of paper. Also, with the instructions in the program itself, it gives the player a better sense of "being there," a very important part of good Adventures. If this feature makes the program unplayable on a 16K machine, so what? *Mansion of Doom* has always been billed and advertised as a 32K cassette Adventure.

We appreciate Mr. Gani's *PCLEAR* tip for disk users, but personally no one at Pal Creations owns or uses a disk drive since we specialize in 32K Adventures and simulations *on cassette*.

We also decided against having a save feature in our Adventures since most people would rather try to solve an Adventure from start to finish. If they can't solve it in one night, then all they have to do is turn the computer off, and they can try to solve it another day. Then the next time they reload it, they will know a little more of what to do and what not to do. All of our cassettes are of extremely high quality and can be reloaded time after time with no degradation in tape quality.

But worst of all was Mr. Gani's reference to a "bug" in the program. *Pal Creations' programs do not have bugs!* If he had spent more time reviewing the program, he would have found clues telling him that "YOREL" was the magic word to get out of the shackles, not "YORL" as he misprinted. And this feature *is not a bug*, it was designed into the program to provide a more magic-enhanced Adventure environment. An Adventurer needs all the help he or she can get when battling against werewolves and vampires, etc.

We at Pal Creations think that *Mansion Of Doom* is an exciting, high quality 32K Adventure and stand by its meager $14.95 purchase price 100 percent. We were amazed that Mr. Gani thought it was overpriced since marketing experts throughout the country keep urging us to raise the prices on all our fine 32K Adventures to $24.95 and $29.95 to be in the same price range as Adventures that are *inferior* to ours. We will continue to offer most our Adventures at $14.95 in order to give TRS-80 Color Computer owners extremely high-quality programming at reasonable prices.

*Leroy C. Smith*
*Pal Creations*

### VIP TERMINAL

*Editor:*

One of the reasons that French food is so good is that the French are merciless critics. Thus, your often "goody goody" reviews, obviously intended not to offend your advertisers, are a disservice both to your readers and to improving the products.

The Color Computer is now maturing to the point where there is some excellent software and worthy of such withering review. But what do we get? Let's take the January 1984 review of the *VIP Terminal* program. This program is certainly one of the best, if not the best available for the CoCo and easily worth twice the price. However, my copy has some interesting features that did not seem to be covered by Mr. Reed.

My use of this program has been strictly to a host CDC Cyber computers (730 and now 835/855). Thus, my first annoyance is that there is no way to reset the default parameters along with autoloading the keystroke multipliers (KSM). My startup then involves the program load, the KSM load, and then resetting the parameters. All this boring detail could be avoided by simply allowing the user to tailor his disk. The load itself seems unnecessarily long since they seem to have the initialization include reading a bad track, and if it is faulty continuing the load. They have the disk rigged so you cannot write on it even though it appears (with the help of their excellent *ZAP* program) that very little is used of the total disk.

The next point is that the x-on/x-off does not seem to work consistently in receiving data. In the tests that I ran to the Cyber last spring, I asked for my I/O to be recorded at the host. The result was that in 51-column mode and 300 Baud, my terminal would send an X-off about half the time to suspend host transmission; the rest of the time a chunk of text would not be recorded.

If I get back into 32-column mode to make sure I got all the text from the host, there is no way to get back into 51 without getting out of the terminal program. Even though the documentation says that the parameter table will always allow this, once you clear the buffer and answer the prompt that you want to get out of Hi-Res, the resolution part of the parameter table never comes up again.

Mr. Reed is correct that there are some nice features in the disk handling part of the program. One peculiarity I have encountered in the disk directory program is that unlike the BASIC directory, the *VIP Terminal* directory appears to scan *every* sector on Track 17 beginning with the third. I am presently using a disk management program to catalog and secure my disk data which duplicates the directory and granule tables on Track 17. The granule table is duplicated to Sector 1 and the Directory from three to 10 is copied from 12 to 17. Thus, the Terminal directory gets two copies, and, if I have killed a file without recataloging, then I get the name of the killed file as well! (The disk management program has a method of using the backup copies to recover a file.

One feature which would be a nice addition would be to be able to change the printer mode without coming out of *Terminal*. Thus some data you want to print out in 80 column and others, like FORTRAN compilations, in 120-character mode.

I mentioned in an earlier letter that I had a problem with the printing of *anything* with *VIP Terminal* (which also happened with *ZAP*). The frustration was that I had no problem printing using the POKE 150,18 for my 2400 Baud interface with any other software than Nelson's. The solution was a retuning of the interface, but left me with the implication that Nelson's was somehow either more finely tuned or differently tuned than that for the usual BASIC. Thus, I think that those with slightly skewed Baud rates would be better off if there was some mechanism in the software that would let them tailor their Baud rate to what works with their equipment.

*Joe Cain*
*Golden, CO*

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*Editor:*

I must take exception with Jim Reed's review of *VIP Super Color Terminal*, in the January issue. There are some problems with the disk commands in version 3.0 dated June 1983. If you have a disk with more than 28 entries, it is impossible to see the remainder of the directory. This is contrary to the instructions on Page 18 of the operators manual, and apparently was not a problem in version 2.0.

I don't believe this is a major problem and I'm sure Mr. Nelson, who obviously is a top rate programmer, could correct this problem. However, I have written to Softlaw

Corp. detailing the problem, received a note asking that I telephone their customer service, which I did. I was then told that they would check on this problem, and never heard from them again. As a matter of fact, the customer service representative didn't even want my name or address, which obviously indicated there was no intention of giving me a reply.

I think the *VIP Terminal* is a fine program. However, the support after the purchase is completely lacking. If the other programs use the same mini-disk operating system, I'll have to be assured that I will not encounter the same problem.

It seems that Mr. Reed is a friend of Tom Nelson, who is a contributing editor to *Rainbow* as well as general council for Softlaw Corp. I feel sure that there is no way Mr. Reed or *Rainbow* would publish a bad review of any Softlaw product.

It should be pointed out that the disk is copy protected which makes it very difficult to try and fix it yourself.

*John Spataro*
*Lynn Haven, FL*

**Editors Note: The Softlaw Corporation (formerly Nelson Software Systems) no longer copy protects its programs. This means that VIP Library programs now *can be backed up*. This should alleviate several of the aforementioned problems.**

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### OWLS EYE LIGHT

*Editor:*

In reference to the review on the Owls Eye Light in your March issue, I installed an Owls Eye on my computer and it looks like original equipment. It is one of the best investments I made for my CoCo. Yes, you have to unplug it to use the joysticks — big deal. It fit my computer fine. Looks good and works *great*.

Did your reviewer really hook it up or did he guess at how it worked?

*Mark Widuch*
*Princeton, IL*

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*Editor:*

I felt I must reply to the review in your March issue on the Owls Eye Light.

First, the ad states it plugs into the joystick port so I had anticipated the joysticks would not work with it. Some of us computer nuts use our computers for more serious things then playing "Pac Man" games anyway.

Second, I have the old style computer with the RAM button and it fit fine.

Third, I don't think the reviewer even installed the light. In the package it doesn't look like a lot but when installed, per the instructions, it looks like a part of the computer.

I have a light kit that mounts in the joysticks. If you have a candle lit in the room you can't tell if it is on. The Owls Eye can be seen in bright sunlight.

You are giving a good product a bum rap with your review.

*Ron Von Holt*
*Marrietta, GA*

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### PHONICS II

*Editor:*

This letter is directed toward the March 1984, Page 242, review of *Phonics II*, a sound-letter association program which uses the unique ability of the Color Computer to direct audio instructions and prompts from a cassette tape recorder through the speaker of the TV to the user, in this case, students just learning to read.

The review was subtitled, "Only Phair," presumably for two reasons which the reviewer mentions. First, he states that the tutorial mode of the program does not require any student participation, after which he mentions that the program "does expect the student to repeat aloud the digraph sound with the narrator." That sounds like student participation to me. In addition, the current release of *Phonics II* (version 2.0) also requires that the student type the consonant digraph before going to the next audio prompt. More student participation.

The second "disappointment" the reviewer mentions is with the single sheet of instructions. If he had taken the time, he might have noticed that the program was well documented within itself. For instance, points at which decisions are to be made within the setting up of the program parameters have the option "NEED MORE INFO." Selecting this option brings forth screens of information useful in making parameter choices (a nice touch, I thought, since many people misplace or won't read the documentation which comes packaged with the software). Perhaps the reviewer would have preferred a "user-hostile" program with reams of documentation necessary to render it understandable.

On to *more* important criticisms. The reviewer states that the instructions were confusing because the program description follows brief loading instructions and a very short warranty statement. He says that he likes to know about something before he attempts to use it. By the way, the instructions he talks about are on the inside of the package. If he had bothered to read the information, which we conveniently placed on the outside of the package (so people wouldn't have to guess about what's on the inside), he would have seen a similar program description!

As the coordinator of software evaluation and computer-delivered instruction of an elementary school of over 500 children and the author of a courseware evaluation instrument used by at least two school districts in Tucson, I attempt to evaluate software on the basis of its educational merit and usefulness with children (witness my review of *LOGO* in the December 1982 edition of *the Rainbow*).

I would simply ask that all software (mine included) reviewed by *the Rainbow* be judged on that basis, rather than the degree to which its packaging conforms to the personal tastes of the reviewer.

Incidently, anyone desiring a copy of my software evaluation form should send a S.A.S.E. to 8370 E. Lee, 85715

*David Hunt*
*Tucson, AZ*

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### GRAPHICOM

*Editor:*

My thanks to Paul Hoffman for a very kind review of *Graphicom*. There was one technical error in his review that must be corrected. In his advice to readers on what parts to get to make your own custom joystick or foot pedal for *Graphicom*, the author directed the readers to use a "five-pin DIN connector" for the joystick port. This is wrong. The joystick port requires a six-pin DIN connector. Radio Shack, on its joysticks, uses a six-pin DIN plug that has been altered by having its center pin removed. Though the resulting plug has only five pins, they are spaced quite differently from the spacing of the pins in a true five-pin DIN connector. Worse yet, while true five-pin DIN connectors are readily available at Radio Shack, the necessary six-pin DIN connector is not available.

The required six-pin joystick plug should be available from local electronic supply houses. If you have trouble finding a source of six-pin DIN connectors, you can purchase two (used but in excellent condition) of them for $5 from us at Cheshire Cat.

I personally highly recommend that purchasers of *Graphicom* make their own custom joysticks. We have come to prefer a joystick made using a Radio Shack joystick mechanism (Cat. No. 271-1705) mounted in a small chassis box (3¼ x 2 x 1⅞ in.) with two buttons mounted along the 3 ¼ by 1 ⅞ inch side. Such a box is not available from Radio Shack, but is available from supply houses handling LMB chassis boxes. The alternative of using a footswitch for the menu button is not quite as good, but it does work reasonably well and is much simpler to construct.

My one overall criticism of the review was that it made *Graphicom* sound a lot more complicated to use than it really is. While it does take a bit of getting used to, once you learn how to control the program, drawing proceeds extremely quickly and simply. I invite any sort of comparison of how long it takes to draw a given artistic picture and a given technical illustration to be made between *Graphicom* and any other existing CoCo graphics drawing program. I'll eat my hat if any other program allows general purpose drawing that is even a quarter as fast as *Graphicom's*.

*Martin H. Goodman, MD*
*San Pablo, CA*

MASTER DIRECTORY V2

Can you find that program you saved last month? Do you have many diskettes with multiple copies and need to organize your life? MASTER DIRECTORY V2 to the rescue! In only seconds add each diskette to MASTER DIRECTORY V2. Now ask MASTER DIRECTORY to find that lost program. Can't remember the filename? Ask for all the files that begin with the letter "C" or ask for all files with an extension of BAS.

What! Two files with the name CATS? Drats! Wait! The file on disk #5 was added on Oct. 5 and the file on disk #9 was added on Nov. 10. Hey fantastic!

Now let's get back to work. Let's see DIR. Hey! How did the filenames get in sequence? Yes, MASTER DIRECTORY V2 will sort the directory and remove the null directory entries. It also saves a copy of the allocator and the directory to protect against those nasty disk errors. Listing may be directed to the TV or the printer. Over 100 diskettes and 3000 filenames can be contained in one master directory.

Buy MASTER DIRECTORY V2 for only $29 pp. Requires 32K DOS (1.0 or 1.1)

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Allows the use of two cassette recorders. Only $49 pp.

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Easy to install. Does not violate COCO warranty. $14pp.

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DEALER INQUIRES INVITED.

# *Model I/III Emulator* Should Be Quite Useful

When the Color Computer first came out, a lot of people were asking if it could run Model I software. The answer, of course, was no; the CoCo is far too different from the Model I and III. The Microsoft Extended BASIC languages are quite similar, though, so the only thing stopping many BASIC programs from running on the CoCo is the very different screen display and character set.

Spectrum Projects' *64 Column Model I/III Emulator* produces a 64 by 16 text display using the *PMODE4* high-resolution graphics mode. The screen memory is placed in the upper 32K of RAM, so 64K memory is required. The character set (in the range 32 to 191 decimal) is almost identical to the Model III's, though the actual character shapes are very different. The block graphic characters are available, both for *PRINTing* and normal point graphics (using *SET*, *RESET* and *POINT*). A Model I/III BASIC program will run on the CoCo with the emulator if:

— it is written entirely in BASIC and does not use *PEEKs*, *POKEs* or *USR* calls (all the locations are different);

— it does not use BASIC commands or functions that are not available in Extended Color BASIC (such as DEFDBL, DEFSNG and DEFINT); and

— it can be loaded into the CoCo (if you are willing to type it in). Since the CoCo's cassette and disk file formats are different from those of the Model I or III, you will have to have some special program on one machine or the other to bridge the gap. Another way would be to send the program over the RS-232 serial I/O ports (if you have RS-232 in the I or III) as an ASCII file; you'll need RS-232 cables on each machine, a "gender-changer" adapter to connect the two male DB-25 plugs and (on the Model III) a null modem adapter. (What I have to say about the Model III goes for the Model 4 as well, assuming you are using it in Model III mode.)

The display is rather hard to read, as 64-column Hi-Res displays usually are. The characters are only three pixels wide, and are plagued with the notorious false colors of *PMODE4*. (Of course, you can almost always turn the color level down to get rid of the color fringes.) The *PRINT @* command now has a range from 0 to 1023 to match the Model I/III's screen locations; *SET*, *RESET* and *POINT* now run from 0 to 127 horizontally and 0 to 47 vertically. If you want an expanded text display simply for your own programming, the emulator will serve reasonably well as none of the CoCo's BASIC commands have been removed.

The *64 Column Model I/III Emulator* should be quite useful to those who have been running BASIC programs on the Model I and III, although the text display has its problems.

**(Spectrum Projects, 95-15 86th Drive, Woodhaven, NY 11421; $19.95 + $3 S/H)**

**— Ed Ellers**

# Double Density Software

# COLOR TERM +PLUS+

If you're looking for the finest terminal software you can buy, look no further! And now we've added a **high-res screen** display that gives you 32 by 16, 42, 51, or 64 by 24 lines.* And you can switch between the high-res screen and the normal screen ***without*** destroying what you have in the buffer! **+ PLUS +** we have a buffer editor, complete up and down load support, on-line cassette or disk reads and writes, off-line and on-line scrolling, pre-entry of data before calling, word wrap, buffer printing, selective printing, change **any** parameter so you can communicate with **any** other computer. You can send and receive Basic programs, ASCII file, as well as machine code, **+ PLUS +** you can save your buffer to tape (Tape or Rom version) or disk (Disk version). You can communicate with the local **BBS, Compuserve™, The Source™,** the main frame at work or school, other color computers, Apples, IBM PC's, TRS-80 Model I, II, III, IV, 12, 16, 100, or any other computer via RS-232.

Compare these features with ***any*** other terminal program:

32 x 16, 42, 51, 64 x 24 Screen
Communications BAUD Rate: 110-19200
Printer Baud Rate: 600-9600
Select Half or Full Duplex.
Select Odd, Even, or No Parity.
Select 7 or 8 Bit Words.
Send Control Characters.
Send a True Line Break.
Separate Keys for Escape and Rubout.
Select All Caps If Needed.
Word Wrap — Eliminate Split Words.
(32 Character Mode)
Selectable Reverse or Normal Video.
(32 Character Mode)

**NOW WITH 42, 51 OR 64 CHARACTERS BY 24 LINES!**

Scroll Protect Up to 9 Lines.
Automatic Capture of Incoming Files, Send One Line At a Time From Your Buffer.
Has Programmable Prompt for "Send Next Line!!
Buffer Size Indicator.
Complete Up and Down Load Support.
Improved Buffer Editor.
On/Off Line Scrolling of Buffer.
On/Off Cassette or Disk Reads and Writes.
Pre-Enter Data Before Going On-Line.
Save/Load Machine Code, Basic Programs or Files.
Select Printer Line Feeds If Needed or Ignore All Line Feeds in Buffer.

*Disk and Rom Pack only (not on tape). PRICE: $29.95 (TAPE) $39.95 (ROM PACK) $39.95 (DISK)

## DOUBLE SPOOLER NEW

Tired of waiting for your listings? printouts? etc.? This is THE Spooling Program!! No need to save your programs in ASCII. You can also spool your files and you can spool **ANYTHING** you print on the screen while a program is running!! Requires a minimum of 32K **AND** the 64K computer can spool really **LARGE** files!! Plus more!!
PRICE: $19.95 (Tape) $21.95 (Disk)

## DOUBLE MEM-DISK NEW

Use that **32K** of unused memory in your **64K** computer for something useful! Store programs in memory and recall them anytime you need them!! Here is a list of the new commands you can enter right from the keyboard:

**MSAVE** — Save the program in memory.
**MLOAD** — Load a named program.
**MKILL** — Kill a program stored in memory.
**MDIR** — List all programs stored in memory.
**MFILE** — Merge a program in high mem with current program in low memory.

Those of you with tape systems will have several programs in memory at once so you don't have to wait on that **SLOW** tape system **AND** those of you with disk systems will be able to use that extra space that is going to waste!!
PRICE: $24.95 (Tape) $26.95 (Disk)

### DOUBLE CABLE

Tired of switching cables everytime you use your modem and printer? This is the fix!! Hook your modem and printer up at the same time! No more switching.
PRICE: $14.95

$2.00 shipping and handling on all orders. $3.00 charge on C.O.D. orders, Mastercard and VISA accepted. Texas residents add 5% sales tax. Allow two weeks for personal checks.

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**Double Density Software**
920 Baldwin Street
Denton, Texas 76201
Phone 817/566-2004.

VISA

## DOUBLE SWITCH NEW

Now you can switch between two different devices **AND** you get an on/off indicator at the same time. Switch your **Modem & Printer** or two printers, etc.
PRICE: $29.95

## DOUBLE DOS BASIC NEW

### 364,000 BYTES!

That's right! Using your 64K Color Computer, and an 80 track drive, you too can have more than **TWICE** as much storage on your disk drive system. **DOUBLE DOS BASIC** allows you to use 35, 40 or 80 track (**double** or single sided) drives all on one system, all at the same time! Your system could consist of a 35 track drive, a two drive AMDEK system, and an 80 track drive, all working, and hooked up to your system! (The AMDEK drives are 40 track drives.) **ALL** commands are supported in **DOUBLE DOS BASIC.** The DOS is **totally** transparent to your BASIC programs! If your system selection is 80 tracks, a PRINT FREE command will return **158** granules! Compare this to the 68 granules your system now returns! The 40 track drives would return 78 granules, 10 more than the 35 track system. **EVERY** command in BASIC is supported by **DOUBLE DOS BASIC.** If you haven't already upgraded to 64K, now is the time! Use your system to its **FULLEST! DOUBLE DOS BASIC** also gives you RESET PROTECTION, unlike most of the other **64K** programs. **AND,** used with our ROM MOVE program, you can also get another 8000 bytes of BASIC addressable memory!

DOUBLE DOS BASIC — $24.95
DOUBLE DOS & ROM MOVE — $24.95

# RAINBOW

*Give us your best:* Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in *the Rainbow's* Scoreboard column. All entries must be received by the first of the month to be eligible for the following month's Scoreboard. They must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o *the Rainbow*.

★ **New Number One** • **Last Month's Number One**

**ALCATRAZ II** (*Spectral Associates*)

| | |
|---|---|
| 9,820 | ★Steve Manderschied, Cincinnati, OH |

**ASSAULT** (*MichTron*)

| | |
|---|---|
| 2,520 | ★Laura Sandman, Louisville, KY |

**ASTRO BLAST** (*Mark Data*)

| | |
|---|---|
| 158,000 | ★Larry Plaxton, Medley, Alberta |
| 157,000 | Scott Drake, Pine City, NY |
| 104,464 | Jim Baker, Florissant, MO |
| 98,000 | Tim Warr, Bellingham, WA |
| 97,000 | Bernard Parent, Ste-Foy, Quebec |

**BASEBALL** (*Radio Shack*)

| | |
|---|---|
| 33-0 | ★Dan Bovey, Wheaton, IL |
| 19-0 | Chris Oberholtzer |

**BERSERK** (*Mark Data*)

| | |
|---|---|
| 8,500 | ★Mark Wooge, Omaha, NE |
| 7,650 | David Garozzo, Morrisville, PA |
| 3,100 | ●Edward Liroff |

**BIRD ATTACK** (*Tom Mix*)

| | |
|---|---|
| 460,275 | ★Kevin Boyle, Saskatoon, Saskatchewan |
| 133,825 | Ellen Ballinger, Uxbridge, Ontario |

**BLOC HEAD** (*Computerware*)

| | |
|---|---|
| 1,006,200 | ★Lindi Wolf, Fairbanks, AK |
| 819,425 | Keith Denhoed, Coalhurst, Alberta |
| 781,350 | Joe Golkosky, Portage, MI |
| 444,525 | Brian Spek, Keswick, Ontario |
| 366,700 | Richard Vehlow, Bayside, NY |

**BUSTOUT** (*Radio Shack*)

| | |
|---|---|
| 42,000 | ★Derrick Kardos, Colonia, NJ |
| 34,700 | Sara Hennessey, Golden Valley, MN |
| 28,720 | Perry Denton, New Baden, IL |
| 27,880 | Mike Wells, Pittsburgh, PA |
| 18,403 | Brad Widdup, Dundas, Ontario |
| 8,579 | Jeff Bitterling, Bowling Green, KY |

**BUZZARD BAIT** (*Tom Mix*)

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|---|---|
| 688,550 | ★David Casterson, Livermore, CA |
| 489,600 | Paul Rumrill, Gales Ferry, CT |
| 484,400 | Nic Witschi, Oak Ridge, TN |
| 450,150 | Chris Elliott, Salisbury, NC |
| 444,200 | Kristopher Staller, Ft. Wayne, IN |
| 412,600 | ●Michael Lynn, Chicago, IL |
| 373,450 | Laurence Witschi, Oak Ridge, TN |
| 322,350 | Michael Popovich, Nashua, NH |
| 304,550 | Kevin Kordana, Poughkeepsie, NY |
| 280,950 | Bruce Tenison, Bay Minette, AL |
| 217,300 | Brian Manderschied, Cincinnati, OH |
| 207,100 | Steve Manderschied, Cincinnati, OH |

**CANYON CLIMBER** (*Radio Shack*)

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|---|---|
| 1,400,200 | ★James Stevenson, Marshall, TX |
| 999,900 | Andre Wagner, Bangor, PA |
| 615,500 | Randy Hankins, Tabor, FL |
| 251,100 | Beverly Herbers, Placentia, CA |
| 230,500 | William Daley, Biloxi, MS |
| 186,700 | Denise Morissette, Sherbrooke, Quebec |
| 165,900 | Kevin Stephens, Boyle, Alberta |
| 145,100 | Dennis Rodenkirch, Janesville, WI |
| 134,900 | Doug Rodenkirch, Janesville, WI |
| 101,400 | Ronnie Volans, Ogdensburg, NY |

**CASHMAN** (*MichTron*)

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|---|---|
| 19,650 | ★Perry Denton, New Baden, IL |
| 16,000 | Scott Oberholtzer |
| 11,130 | Ricky Susfalk, Grand Island, NY |
| 5,690 | Rob Acurto, Ballston Lake, NY |

**CATCH-EM** (*Aardvark*)

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|---|---|
| 79,773 | ★Marsha Smith, North Vernon, IN |

**CHOPPER STRIKE** (*MichTron*)

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|---|---|
| 63,000 | ★Andrew Figel, Sardis, OH |
| 47,400 | David Figel, Sardis, OH |
| 42,100 | Brian Peterson, Muskegon, MI |
| 29,900 | Bobby Figel, Sardis, OH |

**CLOWNS & BALLOONS** (*Radio Shack*)

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|---|---|
| 89,430 | ★Perry Denton, New Baden, IL |
| 85,680 | Teresa Stutsman, N. Little Rock, AR |
| 83,710 | Don Fraser, Shakope, MN |
| 82,730 | Jeffrey A. Groves, Hooksett, NH |
| 79,920 | Tim Wiechmann, Marblehead, MA |

**COLOR CUBES** (*Radio Shack*)

| | |
|---|---|
| 4:10 | ★Chris Cope, Central, SC |

**COLOR OUTHOUSE** (*MichTron*)

| | |
|---|---|
| 160,200 | ★David Lazar, Englishtown, NJ |
| 101,650 | Davey Devlin, Clyde, NC |
| 42,276 | ●Perek Mall, Long Grove, IL |

**COLORPEDE** (*Intracolor*)

| | |
|---|---|
| 10,001,051 | ★Mark Smith, Santa Ana, CA |
| 3,355,248 | ●Scott Drake, Pine City, NY |
| 2,547,299 | Rich McGervey, Morgantown, WV |
| 2,471,342 | Vincent Lok, Ontario, Canada |
| 1,317,729 | Michel Hengartner, Ste-Foy, Quebec |
| 847,356 | John Bondelier, Perrysburg, OH |
| 373,342 | Anthony Ruiz, Toledo, OH |
| 132,125 | Doug Rodenkirch, Janesville, WI |
| 65,990 | Dan Sobczak, Mesa, AZ |
| 55,550 | Shawn Chirrey, Mississauga, Ontario |
| 46,503 | Lisa Ballinger, Uxbridge, Ontario |

**COLOR ZAP** (*Spectral Associates*)

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|---|---|
| 146,510 | ★Bernard Parent, Ste-Foy, Quebec |
| 139,630 | Pierre Rousseau, Cap-Rouge, Quebec |

**CU*BER** (*Tom Mix*)

| | |
|---|---|
| 196,090 | ★Randall F. Edwards, Dunlap, KS |
| 49,510 | Doug Kleir, Grand Rapids, MI |
| 12,430 | William Wirsig, Dunlap, KS |

**CUBIX** (*Spectral Associates*)

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|---|---|
| 28,500 | ★Randall Edwards, Dunlap, KS |
| 26,240 | ●Perry Denton, New Baden, IL |
| 21,500 | Michael Rosenberg, Prestonsburg, KY |
| 19,719 | Philip Daulton, Louisville, KY |
| 14,950 | Dave Garozzo, Morrisville, PA |
| 14,320 | D. Seibel, Tumbler Ridge, British Columbia |
| 13,590 | Aaron Peelle, Bennington, VT |

**DANGER RANGER** (*Med Systems Software*)

| | |
|---|---|
| 1,268 | ★Rick Arthur, Ballston Lake, NY |

**DEVIL ASSAULT** (*Tom Mix*)

| | |
|---|---|
| 289,300 | ★Michael Rosenberg, Prestonsburg, KY |
| 271,106 | Peter Niessen, Carlisle, MA |
| 96,000 | Rick Arthur, Ballston Lake, NY |
| 69,600 | Gregory Rhinehart, St. Charles, MO |

**DOODLE BUG** (*Computerware*)

| | |
|---|---|
| 1,767,630 | ★Perry Denton, New Baden, IL |
| 427,570 | Eiko Cary, National City, CA |

**DOUBLE BACK** (*Radio Shack*)

| | |
|---|---|
| 1,125,000 | ★Mark Hurst, Sheridan, OR |
| 1,080,000 | Phillipe Duplanties, St. Jerome, Quebec |
| 605,890 | Peter Sherburne, Highland, CA |
| 474,040 | Paul Moritz, Butte, MT |
| 435,570 | Phillippe Morsan, St. Jerome, Quebec |
| 52,750 | Christopher Porter, Naranja Lakes, FL |

**ELECTRON** (*Tom Mix*)

| | |
|---|---|
| 41,750 | ★Michael Rosenberg, Prestonsburg, KY |
| 22,990 | Alan Morris, Chicopee, MA |
| 19,500 | Robby Presson, Florissant, MO |
| 4,515 | Mark Raphael, Englishtown, NJ |

**FLYBY** (*Chromasette*)

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|---|---|
| 104,980 | ★David Finberg, Annandale, VA |
| 28,910 | Ron Suedersky, Universal City, TX |
| 20,110 | Rick Mansell, Calgary, Alberta |
| 16,670 | Michael Rhattigan, Cory, NC |
| 2,805 | Dan Sobczak, Mesa, AZ |

**FOOD WAR** (*Arcade Animation*)

| | |
|---|---|
| 208,000 | ★Chris Oberholtzer |
| 178,910 | Kevin Boyle, Saskatoon, Saskatchewan |

**THE FROG** (*Tom Mix*)

| | |
|---|---|
| 109.500 | ★Pat Craddick, Janesville, WI |
| 95,790 | Eileen Kaakee, Royal Oak, MI |
| 89,910 | ●James Baker, Salt Lake City, UT |
| 79,240 | Jeanne Hawkins, Deltona, FL |
| 73,350 | Evelyn Gagnon, Ontario, Canada |
| 48,500 | Terry Sheridan, Janesville, WI |
| 19,922 | Elizabeth Pierce, Exeter, NH |

**FROG TREK** (*Oelrich Publications*)

| | |
|---|---|
| 16,480 | Sara Aliff, Northeast, MD |

**FROGGER** (*The Cornsoft Group*)

| | |
|---|---|
| 63,800 | ★Carmen Thew, Surrey, British Columbia |
| 53,965 | Ian Clark, Albion, MI |
| 32,010 | Laura Schooley, Richmond, VA |
| 27,940 | Perry Denton, New Baden, IL |
| 25,425 | Kanti Dinda, Kingston, Ontario |
| 22,325 | Ric Rice, Crystal River, FL |

**FROGGIE** (*Spectral Associates*)

| | |
|---|---|
| 74,050 | ★Mike Garozzo, Morrisville, PA |
| 68,680 | ●Carmen Thew, Surrey, British Columbia |

**GALACTIC ATTACK** (*Radio Shack*)

| | |
|---|---|
| 67,750 | ★Chuck Gaudette, Monroe, CT |
| 58,000 | Terry Steen, San Bernadino, CA |
| 55,360 | Donald Thompson, Lubbock, TX |
| 54,200 | Mike Hughey, King George, VA |
| 54,000 | Craig Edelheit, W. Bloomfield, MI |
| 41,290 | Sean Dutton, Goose Bay, Labrador |

**GALAX ATTAX** (*Spectral Associates*)

| | |
|---|---|
| 253,900 | ★Shawn McAlpin, Louisville, KY |
| 113,650 | Darrin Filand, WA |
| 104,550 | Mitch Hayden, Univ. of MN |
| 82,650 | Steve Hargis, Tucson, AZ |
| 75,950 | Richard Lacharite, Sherbrooke, Quebec |
| 41,800 | Sean Dutton, Goose Bay, Labrador |

**GHOST GOBBLER** (*Spectral Associates*)

| | |
|---|---|
| 1,007,430 | ★Todd Brannam, Charleston Hts., SC |
| 825,250 | Randy Gerber, Wilmette, IL |
| 423,390 | Rich McGervey, Morgantown, WV |
| 255,000 | John Osborne, Kincardine, Ontario |
| 228,290 | Patricia Lau, York, PA |
| 65,320 | Craig Dutton, Goose Bay, Labrador |

**GLAXXONS** (*Mark Data*)

| | |
|---|---|
| 9,892 | ★Ellen Ballinger, Uxbridge, Ontario |

**GUARDIAN** (*Quasar Animations*)

| | |
|---|---|
| 24,105 | ★Bill Pollack, Sherburne, NY |
| 3,090 | Davey Devlin, Clyde, NC |

**INTERGALACTIC FORCE** (*Microdeal*)

| | |
|---|---|
| 113,600 | ★Alex Taylor, Manchester, England |

**INVASION** (*Spectral Associates*)

| | |
|---|---|
| 52,350 | ★Tina Pihl, Guilford, CT |

**JUNIOR'S REVENGE** (*Computerware*)

| | |
|---|---|
| 2,099,300 | ★Shawn McAlpin, Louisville, KY |
| 1,115,300 | Ryan Van Manen, Grand Rapids, MI |
| 658,000 | Pat Craddick, Janesville, WI |
| 354,300 | Shawn Chirrey, Mississauga, Ontario |
| 243,800 | Dan Ralston, Janesville, WI |
| 229,100 | Doug Kleir, Grand Rapids, MI |
| 161,600 | Gary Hansen, Deerwood, MN |
| 156,200 | Robert Conyer, Willingboro, NJ |

**KATERPILLAR ATTACK** (*Tom Mix*)

| | |
|---|---|
| 18,949 | ★Vadim Gotovsky, Toronto, Ontario |
| 15,821 | Alex Gotovsky, Toronto, Ontario |
| 8,659 | Sean Dutton, Goose Bay, Labrador |
| 5,279 | Lisa Ballinger, Uxbridge, Ontario |

# SCOREBOARD

**KEYS OF THE WIZARD** *(Spectral Associates)*

| | |
|---|---|
| 662 | ★Susan Ballinger, Uxbridge, Ontario |

**THE KING** *Tom Mix)*

| | |
|---|---|
| 10,000,100 | ★Mark Smith, Santa Ana, CA |
| 4,040,300 | ●Andy Truesdale, Ferguson, MO |
| 3,343,000 | Corey Friedman, Minnetonka, MN |
| 2,410,200 | Candy Harden, Birmingham, AL |
| 2,367,900 | Richard Lacharite, Sherbrooke, Quebec |
| 2,213,000 | James Quadarella, Brooklyn, NY |
| 1,595,000 | Christopher Porter, Naranja Lakes, FL |
| 1,300,000 | Richard Apollo, Farmingdale, NY |
| 173,000 | Davey Devlin, Clyde, NC |
| 157,700 | Blaine Willick, Hinton, Alberta |
| 144,850 | Todd Ulrich, Baltimore, MD |
| 107,000 | Chris Cope, Central, SC |
| 100,300 | Anthony Ruiz, Toledo, OH |

**KLENDATHU** *(Radio Shack)*

| | |
|---|---|
| 1,182,685 | ★David L. Ferris, Shickshinny, PA |
| 561,893 | Ellen Ballinger, Uxbridge, Ontario |

**KRON** *(Oregon Color Computers)*

| | |
|---|---|
| 73,530 | ★Christopher Porter, Naranja Lakes, FL |

**LANCER** *(Spectral Associates)*

| | |
|---|---|
| 2,354,000 | ★Alex State, Las Vegas, NV |
| 636,500 | Larry Capen, Folsom, CA |
| 617,500 | Donna Willoughby, Brookfield, IL |
| 583,200 | Sharon Casten, Folsom, CA |
| 474,250 | Mike Rausch, Denver, CO |
| 469,400 | Jeff Jackson, Littleton, CO |
| 462,100 | Scott Jackson, Littleton, CO |
| 185,650 | William Wirsig, Dunlap, KS |

**LASERWORM & FIREFLY** *(the Rainbow)*

| | |
|---|---|
| 54,672 | ★Michael Rosenberg, Prestonsburg, KY |
| 19,402 | D. Seibel, Tumbler Ridge, British Columbia |
| 18,750 | Jim Partridge, Clinton, CT |

**LUNAR ROVER PATROL** *(Spectral Associates)*

| | |
|---|---|
| 162,100 | ★Sara Aliff, Northeast, MD |
| 154,650 | Tom Aliff, Jr., Northeast, MD |
| 66,900 | Wayne Johansen, Rocanville, Saskatchewan |
| 65,350 | Gary Jones, Dale, TX |
| 62,850 | Randall Edwards, Dunlap, KS |
| 61,150 | William Wirsig, Dunlap, KS |
| 56,000 | Richard Apollo, Farmingdale, NY |
| 40,700 | Ricky Susfalk, Grand Island, NY |
| 26,650 | Todd Ulrich, Baltimore, MD |
| 21,300 | Tom Alascia, Baltimore, MD |

**MARATHON** *(the Rainbow)*

| | |
|---|---|
| 101,520 | ★David Dean, West Mansfield, OH |
| 55,110 | Michael Rhattigan, Cory, NC |
| 15,750 | Grayson Yeargin, Richmond, VA |

**MEGA-BUG** *(Radio Shack)*

| | |
|---|---|
| 60,000 | ★Robin Worthem, Milwaukee, WI |
| 18,902 | John Tiffany, Washington, DC |
| 15,999 | Ed Mitchell, Ragged Mountain, CO |
| 14,297 | Aleisha Hemphill, Los Angeles, CA |
| 9,070 | Brad Gaucher, Hinton, Alberta |
| 7,542 | Dick Volans, Ogdensburg, NY |
| 6,128 | Denise Morissette, Sherbrooke, Quebec |
| 6,039 | Gordon Kilbreath, Hinton, Alberta |
| 3,436 | Tina Pihl, Guilford, CT |

**METEORS**

| | |
|---|---|
| 14,200 | ★Craig Dutton, Goose Bay, Labrador |

**MICROBES** *(Radio Shack)*

| | |
|---|---|
| 406,350 | ★Greg C. Strother, Madison, WI |
| 134,630 | Patrick Daley, Biloxi, MS |

**MONSTER MAZE** *(Radio Shack)*

| | |
|---|---|
| 533,450 | ★John Hankerd, Gaines, MI |
| 300,000 | James Stevenson, Marshall, TX |
| 60,120 | Steve Thomas, Ogdensburg, NY |
| 50,570 | Craig Dutton, Goose Bay, Labrador |

**MOON HOPPER** *(Computerware)*

| | |
|---|---|
| 956,470 | ★Shawn McAlpin, Louisville, KY |

**THE NEMESIS** *(Sorcerer Software)*

| | |
|---|---|
| 11,946,000 | ★Mark Smith, Santa Ana, CA |

**NINJA WARRIOR** *(Programmer's Guild)*

| | |
|---|---|
| 106,300 | ★Bud Seibel, Tumbler Ridge, British Columbia |
| 102,400 | Christopher Gelowitz, Claresholm, Alberta |
| 75,300 | Brad Gaucher, Hinton, Alberta |
| 46,400 | ●Daniel Milbrath, Ann Arbor, MI |
| 36,800 | Greg Lowry, Davisburg, MI |
| 34,700 | Jeff Weeks, Hinton, Alberta |
| 26,300 | Blaine Willick, Hinton, Alberta |

**PAC-ATTACK II** *(Computerware)*

| | |
|---|---|
| 56,014 | ★Lisa Welte, Baxter, TN |

**PAC DROIDS** *(Programmer's Guild)*

| | |
|---|---|
| 1,958,500 | ★Stefan Lapointe, Chateauguay, Quebec |

**PAC 'EM** *(the Rainbow)*

| | |
|---|---|
| 301 | ★David Dean, West Mansfield, OH |

**PAC-TAC** *(Tom Mix)*

| | |
|---|---|
| 100,630 | ★David Dean, West Mansfield, OH |

**PHANTOM SLAYER** *(Med Systems Software)*

| | |
|---|---|
| 2,488 | ★Troy Messer, Joplin, MO |
| 1,852 | Curtis Boyle, Saskatoon, Saskatchewan |
| 1,306 | Marc Hassler |
| 652 | Michael Brooks, Glade Spring, VA |
| 604 | J. Powell, Bournemouth, England |
| 342 | Susan Ballinger, Uxbridge, Ontario |

**POLTERGEIST** *(Radio Shack)*

| | |
|---|---|
| 13,565 | ★Michael Rhattigan, Cory, NC |
| 6,455 | ●Rich Van Manen, Grand Rapids, MI |
| 4,995 | Ken Mahaffey, Erie, IL |
| 4,970 | Tim Warr, Bellingham, WA |
| 4,960 | Doug Schwartz, Glendale, AZ |
| 4,790 | Brad Gaucher, Hinton, Alberta |

**POOYAN** *(Datasoft)*

| | |
|---|---|
| 273,450 | ★Davey Devlin, Clyde, NC |
| 165,150 | ●Wib Merrithew, Oshawa, Ontario |
| 164,950 | Ronny Ong, Arlington, TX |
| 156,300 | Daniel Belisle, Montreal, Quebec |
| 105.100 | Frederic Daoud, St-Jean, Quebec |
| 79,000 | D. Seibel, Tumbler Ridge, British Columbia |
| 73,650 | Michael Rosenburg, Prestonsburg, KY |
| 62,700 | Allison Germaneso, Ringwood, NJ |
| 57,400 | Rick Arthur, Ballston Lake, NY |
| 55,000 | David Lazar, Englishtown, NJ |

**POPCORN** *(Radio Shack)*

| | |
|---|---|
| 32,000 | ★Lisa Welte, Baxter, TN |
| 16,180 | David Kennedy, Denham Springs, LA |

**PROJECT NEBULA** *(Radio Shack)*

| | |
|---|---|
| 1,065 | ★William Daley, Biloxi, MS |
| 995 | ●Dan Bovey, Wheaton IL |
| 960 | Ian Clark, Albion, MI |
| 885 | John Oliver, Williamstown, WV |
| 760 | Patrick Daley, Biloxi, MS |

**PROTECTORS** *(Tom Mix)*

| | |
|---|---|
| 594,614 | ★Mark Smith, Santa Ana, CA |
| 594,610 | ●Roland Hendel, Mississauga, Ontario |
| 358,514 | Cameron Amick, Reisterstown, MD |
| 347,873 | Derek Mall, Long Grove, IL |
| 275,810 | Julian Bond, Berkeley, CA |

**PYRAMID** *(Radio Shack)*

| | |
|---|---|
| 220 | ★Harry L. Perkins III, Norfolk, VA |
| 220 | ★Chris Cope, Central, SC |
| 220 | ★Cornelius Caesar, West Germany |
| 220 | ★Brian Boehnlein, South Bend, IN |
| 220 | ★John Allen, Clemson, SC |
| 200 | Greg Burke, Kenora, Ontario |
| 200 | Kenton G. Fifield, Fort Francis, Ontario |
| 200 | Sue Knobloch, Oshkosh, WI |
| 180 | Mark Bitterling, Bowling Green, KY |

**RAINBOW ROACH** *(the Rainbow)*

| | |
|---|---|
| 10,500 | ★Michael Rhattigan, Cory, NC |

**REACTOIDS** *(Radio Shack)*

| | |
|---|---|
| 88,615 | ★Robbie Anderson, Monrovia, CA |
| 36,320 | Roger Rothove, Warrensburg, MO |
| 26,275 | Jeff Loeb, Mobile, AL |

**RETURN OF THE JET-I** *(ThunderVision)*

| | |
|---|---|
| 365,934 | ★Roger Buzard, Lima, OH |
| 148,112 | Matt Griffiths, Stilwell, KS |
| 135,306 | Peter Niessen, Carlisle, MA |

**ROBOTTACK** *(Intracolor)*

| | |
|---|---|
| 2,216,950 | ★Randy Hankins, Tabor, IA |
| 1,512,200 | Robert Kiser, Monticello, MS |
| 1,424,300 | John Osborne, Kincardine, Ontario |
| 1,219,810 | Steve Skrzyniarz, Tacoma, WA |
| 815,000 | Philip Perry, Edmonton, Alberta |
| 394,650 | Tina Pihl, Guilford, CT |

**SANDS OF EGYPT** *(Radio Shack)*

| | |
|---|---|
| 82 | ★John Allocca, Yonkers, NY |
| 87 | ●Kim Van Camp, State Center, IA |

**SEA DRAGON** *(Adventure International)*

| | |
|---|---|
| 137,500 | ★Peter Niessen, Carlisle, MA |
| 75,750 | ●Steve Schweitzer, Sewell, NJ |
| 60,430 | Steve Skrzyniarz, Tacoma, WA |
| 56,760 | Alan Morris, Chicopee, MA |
| 50,300 | Remi Riess, Val Caron, Ontario |

**SEA QUEST** *(Mark Data)*

| | |
|---|---|
| 230 | ★Casey Stein, Binghamton, NY |

**SHARK TREASURE** *(Computerware)*

| | |
|---|---|
| 245,000 | ★Manon Bertrand, Hauterive, Quebec |
| 175,000 | Maurice Boyle, Saskatoon, Saskatchewan |

**SHENANIGANS** *(Mark Data)*

| | |
|---|---|
| 164 | ★Richard Booth, Westerville, OH |

**SHOOTING GALLERY** *(Radio Shack)*

| | |
|---|---|
| 120,640 | ★Robert J. Wallace, Waldorf, MD |
| 59,520 | Vernell Peterson, Radcliff, KY |
| 44,870 | Mark Nichols, Birsay, Saskatchewan |
| 44,480 | R. Duguay, St. Bruno, Quebec |

**SKIING** *(Radio Shack)*

| | |
|---|---|
| 12:08 | ★Kelly Kerr, Wentzville, MO |
| 21:35 | Jean-Claude Taliana, Brossard, Canada |
| 44:02 | Brad Gaucher, Hinton, Alberta |

**SNAIL'S REVENGE** *(the Rainbow)*

| | |
|---|---|
| 34,860 | ★Michael Rosenburg, Prestonsburg, KY |
| 11,380 | Varunee Turner, Kamloops, British Columbia |
| 6,150 | Alan Sadler, Northwood, ND |
| 5,690 | Clayton Martin, Ontario, Canada |
| 5,320 | David Holland, Tofino, British Columbia |
| 3,120 | Dan Ralston, Janesville, WI |
| 2,250 | Bob Howard, Ontario, Canada |
| 1,340 | Dan Sobczak, Mesa, AZ |

**SOLO POKER** *(Radio Shack)*

| | |
|---|---|
| 850 | ★Granville Bonyata, Tallahasse, FL |
| 740 | Allan Mercurio, Portsmouth, RI |

**SPACE ACE** *(Spectral Associates)*

| | |
|---|---|
| 1,364 | ★Perry Denton, New Baden, IL |

**SPACE AMBUSH** *(Computerware)*

| | |
|---|---|
| 1,035,680 | ★Curtis Boyle, Saskatoon, Saskatchewan |

**SPACE ASSAULT** *(Radio Shack)*

| | |
|---|---|
| 1,632,450 | ★Walter Brokx, Granisle, British Columbia |
| 358,660 | Mike Snelgrove, Oshawa, Ontario |
| 354,860 | Bruce Madariaga, College Park, MD |
| 238,580 | John Cole, King City, Ontario |
| 224,130 | Derrick Kardos, Colonia, NJ |

**SPACE INVADERS** *(Spectral Associates)*

| | |
|---|---|
| 4,862,040 | ★F.U. Ingham, Clyde, WI |
| 36,960 | Sean Dutton, Goose Bay, Labrador |

# MORE... RAINBOW SCOREBOARD

**SPACE SHUTTLE** *(Tom Mix)*

| | |
|---|---|
| 595 | ★Steve Schweitzer, Sewell, NJ |
| 585 | Randall F. Edwards, Dunlap, KS |
| 575 | Fred Weissman, Brookline, MA |
| 571 | Ted McDonald, Summerville, SC |
| 566 | Tim Smith, San Rafael, CA |
| 547 | Mike Forman, Topeka, KS |

**SPACE WAR** *(Spectral Associates)*

| | |
|---|---|
| 400,190 | ★Mark Felps, Bedford, TX |
| 365,550 | Randall Edwards, Dunlap, KS |
| 116,000 | Peter Niessen, Carlisle, MA |
| 52,380 | Jim Baker, Florissant, MO |
| 13,000 | Susan Ballinger, Uxbridge, Ontario |

**STARBLAZE** *(Radio Shack)*

| | |
|---|---|
| 9,050 | ★Judith Simon, Warrendale, PA |
| 6,250 | ●Mark Welte, Baxter, TN |
| 5,500 | Beverly Herbers, Placentia, CA |
| 5,350 | Nancy Herbers, Placentia, CA |
| 5,100 | Tom Chew, Cranston, RI |

**STARFIRE** *(Intellectronics)*

| | |
|---|---|
| 10,000,050 | ★David Tillery, University of Minnesota |
| 3,444,500 | John DeMuth, Prairie de Chien, WI |
| 2,102,450 | Dean Bouchard, Kingston, Nova Scotia |
| 1,420,000 | Steve Schweitzer, Sewell, NJ |
| 1,000,050 | Chuck Ladig, Suisun City, CA |

**STARSHIP CHAMELEON**

| | |
|---|---|
| 95,900 | ★Craig Dutton, Goose Bay, Labrador |

**STORM ARROWS** *(Spectral Associates)*

| | |
|---|---|
| 68,400 | ★Jim Irvine, Sudbury, Ontario |

**TIME BANDIT** *(MichTron)*

| | |
|---|---|
| 109,170 | ★Mark Wooge, Omaha, NE |
| 106,720 | Glen Heidebrecht, Topeka, KS |
| 78,270 | David Lazar, Englishtown, NJ |
| 74,800 | ●Daniel Milbrath, Ann Arbor, MI |
| 48,800 | Scott Oberholtzer |
| 19,200 | Chris Smith, Cincinnati, OH |

**TRAILIN' TAIL** *(the Rainbow)*

| | |
|---|---|
| 24,415 | ★Kentong Fifield, Fort Frances, Ontario |

**TRAPFALL** *(Tom Mix)*

| | |
|---|---|
| 113,408 | ★Rich Trawick, N. Adams, MI |
| 104,456 | Robert Cattral, Ottawa, Ontario |
| 104,424 | Brennan Baybeck, Traverse City, MI |
| 104,368 | John Osborne, Kincardine, Ontario |
| 98,588 | Dan Burch, Louisville, KY |
| 50,160 | Mike Sengstock, Meriden, CT |
| 48,326 | Adam Jensen, Racine, WI |
| 48,188 | Elizabeth Peirce, Exeter, NH |

**TUBE FRENZY** *(Aardvark)*

| | |
|---|---|
| 544,560 | ★Perry Denton, New Baden, IL |
| 240,060 | Randall Edwards, Dunlap, KS |
| 230,000 | Ken Felix, Crystal Lake, IL |
| 98,640 | David Hogue, Mercer, PA |

**TUT'S TOMB** *(Mark Data)*

| | |
|---|---|
| 31,740 | ★George Kaakee, Royal Oak, MI |
| 27,500 | Eileen Kaakee, Royal Oak, MI |

**VENTURER** *(Aardvark)*

| | |
|---|---|
| 6,718,200 | ★Kyle Keller, Overland Park, KS |
| 4,126,200 | Greg Scott, Orlando, FL |
| 2,291,100 | Mike Sitzer, Roslyn, NY |
| 2,657,350 | Brian Panepinto, Spencerport, NY |
| 1,769,400 | Todd Hauschildt, Red Wing, MN |
| 1,292,500 | Richard Vehlow, Bayside, NY |

**WHIRLYBIRD RUN** *(Spectral Associates)*

| | |
|---|---|
| 516,450 | ★Dan Shargel, Arroyo Grande, CA |
| 103,900 | Dann Fabian, Crestview, FL |
| 98,400 | Dave Lubnow, Sussex, NJ |
| 87,350 | Philip Daulton, Louisville, KY |
| 73,950 | Pat Craddick, Janesville, WI |
| 52,000 | Chris Cope, Central, SC |
| 41,000 | Rich Apollo, Farmingdale, NY |

**WILDCATTING** *(Radio Shack)*

| | |
|---|---|
| 63,723 | ★Michael Rosenberg, Prestonsburg, KY |
| 48,682 | David Rodgers, Carbondale, IL |
| 38,318 | Ellen Ballinger, Uxbridge, Ontario |
| 34,828 | Kerri Dutton, Goose Bay, Labrador |
| 29,953 | Lisa Ballinger, Uxbridge, Ontario |

**ZAKSUND** *(Elite Software)*

| | |
|---|---|
| 1,256,000 | ★Robert Conyer, Willingboro, NJ |
| 1,128,050 | Richard Minton, West Frankfort, IL |
| 1,008,100 | Andy Mickelson, Granville, OH |
| 950,500 | Michael Rothman, Solon, OH |
| 910,000 | Steve Schweitzer, Sewell, NJ |

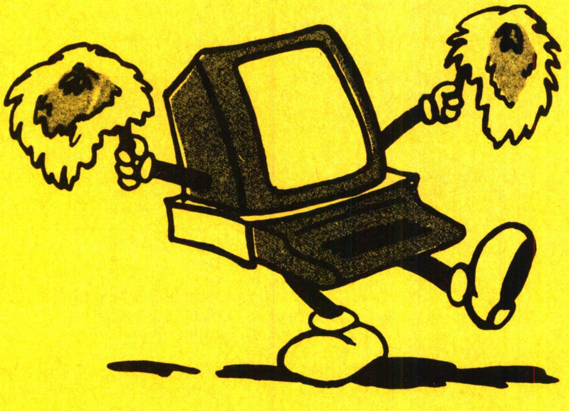
**ZAXXON** *(Datasoft)*

| | |
|---|---|
| 1,510,000 | ★James Quadrella, Brooklyn, NY |
| 401,900 | Mike Hughey, King George, VA |
| 370,400 | Chris Coyle, Selden, NY |
| 235,200 | Rich McGervey, Morgantown, WV |
| 196,500 | F.U. Ingham, Clyde, WI |
| 126,200 | Jon Laustsen, Scotia, NY |
| 118,700 | Eric Laustsen, Scotia, NY |
| 110,600 | Dan Ralston, Janesville, WI |
| 105,900 | Tina Pihl, Guilford, CT |
| 104,800 | Jeff Weeks, Hinton, Alberta |
| 83,400 | Kelly Stiner, Kingsley, MI |
| 80,300 | Darren Greenwalt, Livermore, KY |
| 73,600 | Shawn Chirrey, Mississauga, Ontario |

**ZERO G** *(Chromasette)*

| | |
|---|---|
| 52,235 | ★Mark Smith, Santa Ana, CA |

***— Kevin Nickols***



# *Whole Numbers* And *Decimals* Handy Aids For Teachers

*Whole Numbers* and *Decimals* are education software programs designed to prepare printed worksheets for any number and variety of mathematical problems. Designed and distributed by Shamrock Software of Radnor, Ohio, these programs provide welcomed material for the classroom teacher. The programs are designed to give practice on addition, subtraction, multiplication and division of whole numbers or decimal numbers. Please note that these programs are sold separately.

The program contains a series of subroutines used to formulate each problem type. The programs are written in BASIC language and instructions are given for ways to alter the programs for varied use. This is a welcomed feature and not provided by many software distributors. The changes need to be made prior to running the program because the [BREAK] key and the list command will be disabled when the program is run. You can restore the list function by *POKEing 383,0* as mentioned many times in this magazine.

The programs are printer-oriented and the math problems generated by the programs are not listed on the video screen. Thus, if you do not have access to a printer, you will find this program rather frustrating.

The programs print an actual worksheet of mathematical problems. You have the options regarding the number of problems generated, the range of numbers used (up to 9999), and the number of worksheets printed (each one is different). If you want multiple copies of the same worksheet, you would need to use a copier. The answers are given on the worksheet and designed to be left on the sheet as an aid to the students, or they can be cut off and used as a checklist for grading.

The programs can be used for any age group because any limitations can be utilized. For example, for first graders, simply use numbers less than 10, and adjust the program for addition only. For high school seniors, use numbers in the thousands and mix subtraction with division. Working with decimal numbers is always a little more complicated than working with whole numbers.

The programs are very basic in nature and are cut and dry. There is no title screen, no music, and no bells and whistles. The programs should run on a 4K machine with standard Color BASIC. This program could be used by teachers or parents who want to help their children brush up their arithmetic skills. The documentation is short, but adequate for the operation of the software.

**(Shamrock Software, 4382 Norton Road, Radnor, OH 43066, tape $9.95 for each program)**

**— J.D. Ray**

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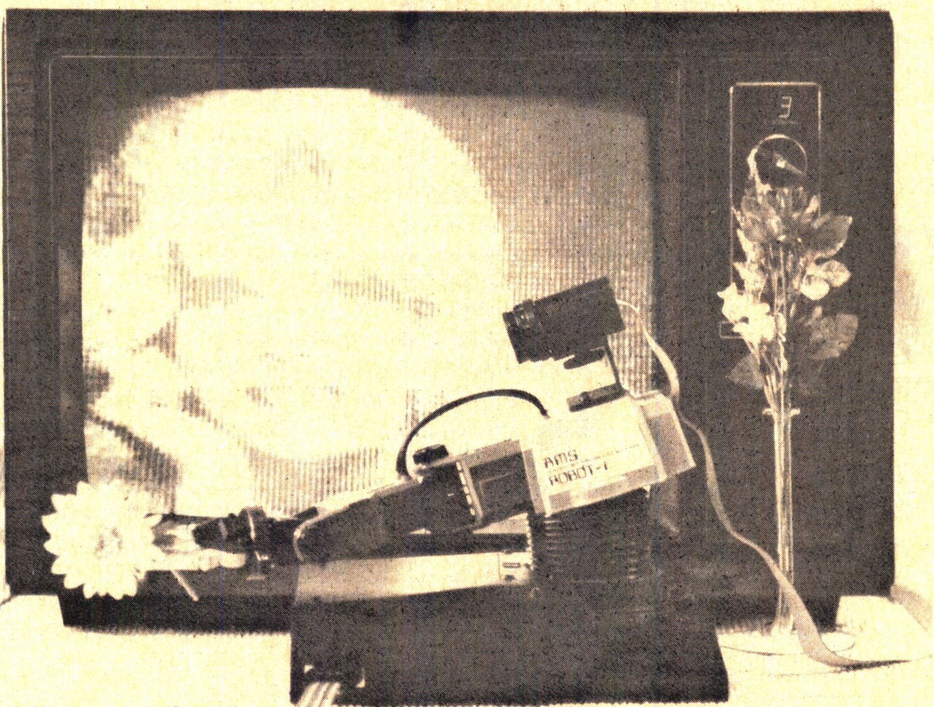

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# *The Investor* — A Good Idea, But A Good Investment?

How would you like a program that will analyze your stock portfolio? Just enter your purchases and sales of shares, dividends taken in cash or reinvested, commissions paid, and splits. You can enter up to 175 transactions divided among 24 different investments. In return, you'll get an up-to-date display showing your current cost basis and market value, realized and unrealized gains and losses, shares purchased and sold, shares purchased with reinvested dividends, annualized rate of return, and other goodies for each stock. You'll also get grand totals for your entire portfolio, and weighted averages and comparative bar graphs so you can compare your holdings and see how each one contributes to your overall position. That's what *The Investor* will do for you—but with some difficulty.

The program actually comes in two parts. The first program on the tape, *INVUPDT*, is used solely to enter your data into a file and write the file to a cassette. Then you *CLOAD* the second program, *INVESTOR*, and input the file from the data cassette. This second program is the one that gives you all the answers.

That can be a bit of a nuisance when you have several transactions to enter, and some of them happen to be sales of mutual fund shares, for which, unlike other securities, the cost basis is generally figured on an average cost rather than on the first-in-first-out method. So you have to stop and write your file to tape, read it into the second program, calculate your cost basis, and then read the file back into the first program and enter the sale.

I don't know why J & A Enterprises chose to do it that way. Neither the cassette label nor the instruction manual has an address or a phone number, so I couldn't call them to ask. I can only guess that it was the only way they could fit the program into 16K and have enough memory to handle a reasonably large number of records. I'd rather have a single self-contained program that requires 32K.

The instruction manual—three 8½ by 11 sheets folded in half to make six pages—carefully illustrates each screen, and describes the various menu options. Most of the essential information is in there somewhere, but you've got to go through it carefully several times before starting to enter any data or you'll waste a lot of time and effort doing it wrong. The manual could be greatly improved by the addition of a summary section and some mention of defaults.

After you enter each record, you are asked "IS DATA CORRECT (Y/N)." Guess which one is the default condition. I found out the hard way after keying in several records that didn't get into the file.

If you change your mind while keying in a record, there's no exit key to return to the main menu. Either you finish keying it in and then go through the delete process, or you [BREAK]. If you [BREAK], where do you get back in without losing your data? I figured out the right line by listing the program, but a business application of this type should be usable by someone with zero programming knowledge. If you must [BREAK], then at least the manual should tell you where to *GOTO*.

To enter a purchase or a dividend reinvestment, you must put in the dollar amount, the cost per share, and the number of shares. If the number of shares is not correct, based on the first two variables, the entry will not be accepted, and the "$ AMOUNT" prompt will come up again. This may be a silly question, but if the program has already calculated the number of shares, why in the world does it have to be entered?

Changing or deleting a record is more difficult than it needs to be. All fields must be reentered even if only one is incorrect. The record to be changed is located first by account number and then by date. If you have more than one transaction in the same stock on the same date, there seems to be no way to change the second one without deleting the first one.

If your portfolio includes mutual funds, as mine does, you may occasionally receive a capital gain distribution (either cash or reinvested in shares) along with your annual dividend. *The Investor* makes no provision for these.

Error trapping should have been better. I read a file full of incorrect data into the second part of the program, and when I selected one of the comparative graph options, it crashed on an FC Error. I believe that a well-written program should never be crashed by bad data. It should either give an answer of some kind, however wrong it may be ("Garbage in, garbage out"), or display a "data out of range" message as a signal to the user that there may be some fault in the entry of records.

There's no doubt that *The Investor* is a very good idea for a program, but I wouldn't buy it in its present form.

**(J & A Enterprises, 74 South Meadow Rd., Plymouth, MA 02360, 16K Extended BASIC cassette $39.95)**

**—Neil Edward Parks**

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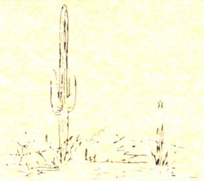
# Saguaro Software



## NEW

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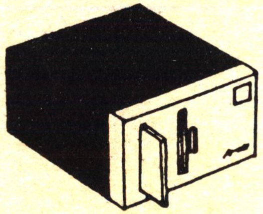

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| Teeeofff | | 18.75 |
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| | | |
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| Cu*ber | | 21.75 |
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| Space Shuttle | | 21.75 |

**PFA**

| | | |
|---|---|---|
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| Patti Pak | | 16.75 |
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| **TYCOON** | Tape-32K | 14.75 |

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| | | |
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| | | |
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**Software Review**

# Excitement, Realism Mark *SAC* Text Game

A wargamer once said, on being accused of being a warmonger, that "the study of war no more made him a warmonger than the study of cancer made a research physician a cancer monger." The recent revulsion for all things military has been partly to blame for a void in one of the most stimulating areas of simulation and gaming, human warfare. This void has been partially filled by *SAC*, a real-time nuclear flight mission simulation.

*SAC* requires a 32K Extended CoCo. Its premise places you in the cockpit of your B-52 on the ready pad at Ramstein Air Base, Germany. Suddenly, the tower orders you to scramble and gives you take-off information. Your fingers fly as you start the big ship's eight engines, advance them to full power, release brakes and begin your take-off roll. After lift-off, you receive information about your assigned target and a fail safe code which must be used to arm your plane's single nuclear bomb. From this point you use your navigational computer to fly to your target, bomb it, return to Ramstein and land. Sound easy? It's anything but.

In the immortal words of one Major "King" Kong (pilot of a B-52 in the movie "Dr. Strangelove"), "Well boys, it looks like this is it . . . noocleeeur combat, toe to toe with the roooosskies." All the way to and from the target you will be hounded by MIGs and SAMs bent on turning you into a charred scar on the Russian landscape. You are far from defenseless, however, for your B-52 is equipped with nine sophisticated navigational and weapons systems including missiles and a chaff dispenser for thwarting MIGs and electronic counter measures to avoid the radar of Soviet SAM bases. Some of these systems may become damaged due to enemy action and must be repaired by the flight engineer, which takes a varying amount of time. You haven't felt excitement until you've screamed in on a target at 600 KTS, rapidly approaching the drop point, while the F/E tries to repair the bomb rack in time to drop the bomb. The last thing you want to do is to make a second run on the target. Dropping the bomb within five miles of ground zero results in the target being destroyed.

This is a text style game, not an arcade. All aircraft conditions and combat reports are in text (a la *Star Trek*) but it is still real-time and the action is fast. I feel that more realism is possible in this style of simulation. There is one very nice graphics feature, however. It is a *PMODE4* map of Russia which you can toggle anytime you want it. It is very nicely done and it shows the position of your B-52, all 36 possible targets and Ramstein.

Primary aircraft control can be selected prior to starting. You can select keyboard only or combinations of keyboard and joystick. I preferred the keyboard only mode as I felt it provided better control. Difficulty is selectable also and ranges from "A piece of cake" (the easiest) to "One way trip" (the hardest). If you are in a vengeful mood you can even go after Tehran.

Documentation is good and completely covers all aspects of the simulation, from take-off to touchdown.

I liked this one a lot, it is exciting and realistic. It also has a sobering aspect that makes one hope that this never really happens — at the same time, you gain a new respect for those men who are faced with the task if it ever does.

**(Pal Creations, 10456 Amantha Ave., San Diego, CA 92126, tape $19.95)**

**— David Johnson**

Aurora Software

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*Hint . . .*

# Small Letters On CGP-115

This may be of interest to anyone who ahs the CGP-115 printer. It changes the size of the print from 40 columns to 80 by using the printer's built-in *CHR$(18)* command instead of by using the DIP switches in the back. Also, it seems to speed things up a bit.

To place the printer in the small letter mode, one must first type in *PRINT#-2,CHR$(18)* and [ENTER]. Then type in *PRINT#-2,*"test" and [ENTER]. Now type in *PRINT#-2,CHR$(17)* [ENTER], and then type in *PRINT #-2,*"test" [ENTER] again. This should place the printer in the 80-column mode and print the word "test" in small letters.

**Jerome Bigge**
**Muskegon, Mich.**

**THE ADVENTURE GENERATOR has been approved for use to create entries in the Rainbow Magazine Adventure Contest.**

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by C.E. Laidlaw

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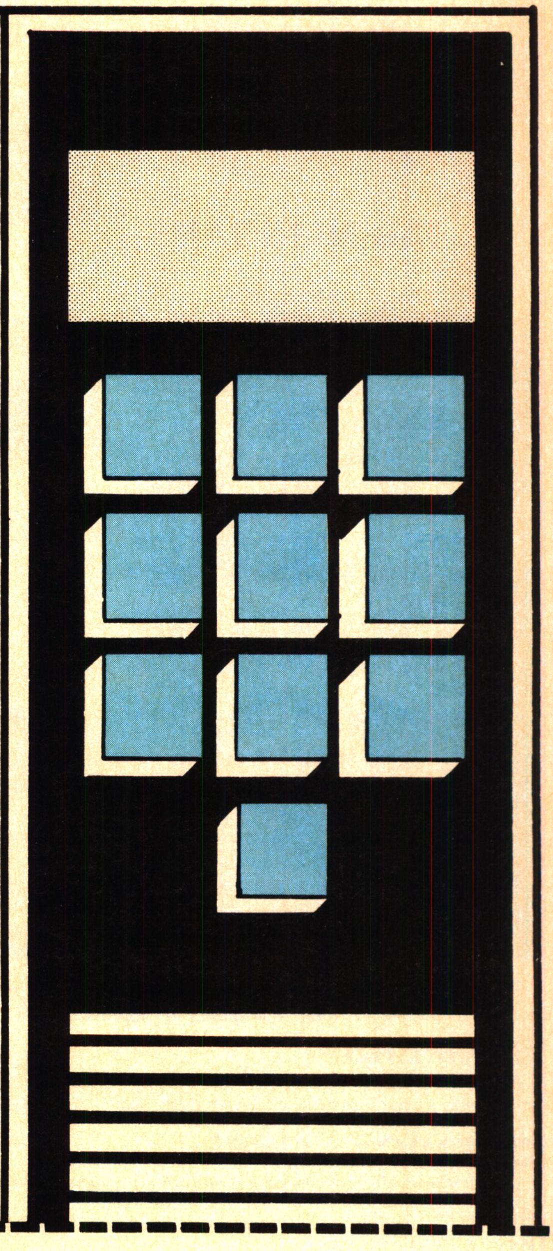

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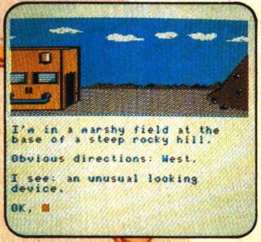
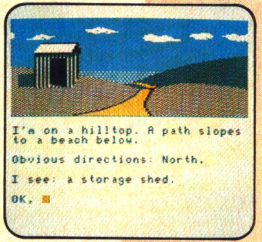


```
I'm in a marshy field at the
base of a steep rocky hill.

Obvious directions: West.

I see: an unusual looking
device.

OK,
```

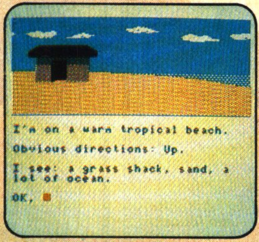


```
I'm on a hilltop. A path slopes
to a beach below.

Obvious directions: North.

I see: a storage shed.

OK,
```

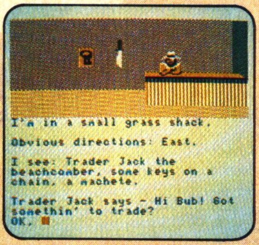


```
I'm on a warm tropical beach.

Obvious directions: Up.

I see: a grass shack, sand, a
lot of ocean.

OK,
```



```
I'm in a small grass shack.

Obvious directions: East.

I see: Trader Jack the
beachcomber, some keys on a
chain, a machete.

Trader Jack says - Hi Bub! Got
somethin' to trade?
OK,
```

Actual photographs taken from Calixto Island screen.

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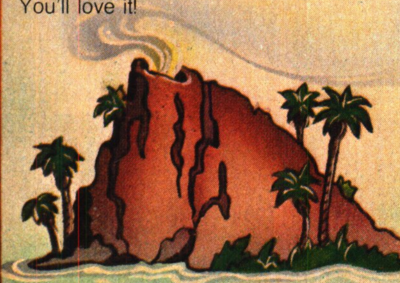

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# Let Your CoCo Spell With *Color Dictionary*

It's nice to see Radio Shack increasing their Color Disk library. Their newest edition which I received to review is *Color Dictionary*. It comes in their familiar three-ring binder, as do *Disk Scripsit* and *Disk Spectaculator*. Upon inspecting the binder, something surprised me — an insert in the beginning of the book. This insert is also the same one I found in my copy of OS-9. It is entitled "Read Me First" and continues:

> All computer software is subject to change, correction, or improvement as the manufacturer receives customer comments and experiences. Radio Shack has established a system to keep you immediately informed of any reported problems with this software, and the solutions. We have a customer service network, including representatives in many Radio Shack Computer Centers, and a large group in Fort Worth, Texas, to help with any specific errors you may find in your use of the programs. We will also furnish information on any improvements or changes that are "cut in" on later production versions.

The reason for quoting this notice is that I can finally give credit to Radio Shack for offering quality after-market support for the Color Computer. They are finally recognizing the importance of their product and (hopefully) see it as a long-term investment. With this sheet comes a registration card that is filled out and mailed to Fort Worth. The sheet also contains a space for a Version Log and the version purchased is listed already. Both the versions of *Color Dictionary* and OS-9 are 01.00.00. I like this idea and I hope that Radio Shack has made this their policy indefinitely.

The manual is laid out in the same format as *Disk Scripsit* or *Spectaculator* and leaves none or very few questions to be asked if the manual is thoroughly read. The program comes with two diskettes. One is the dictionary and the other the system disk. Although much easier to use with two drives, the program will work with only one. *Color Dictionary* is written by Robert G. Kilgus, the same author who wrote *Disk Scripsit*, so it wasn't unusual to see the same type of operating system implemented. In fact, the first menu that appears after typing *RUN"DOS"* is the same menu that appears in *Disk Scripsit* if selection 8 is chosen to "Return to BASIC." There are five choices: 1) Return to BASIC; 2) Run a Program; 3) Start Clock Display; 4) Display Free Space Map; and 5) Copy a File. These all work the same way as in *Disk Scripsit*. At this point the manual informs you to make a copy of *Disk Scripsit* onto the diskette you are using for *Color Dictionary*. (Note: A backup copy of the system disk and the dictionary disk should have been made by now, and the originals stored away!) This is done by choosing option 5 and copying the file "SCRIP/BIN." What Kilgus has done is incorporate *Disk Scripsit* with *Color Dictionary* to be able to switch back and forth between each other. I'm not sure how he accomplished this, but when in the main menu for *Disk Scripsit*, the program will now allow you to press the number 9, which will send you back to *Color Dictionary*! It only works if they are on the same diskette. Now all of your *Scripsit* files can be transferred to the *Color Dictionary* disk and you can go from *Scripsit* to *Dictionary* and back by using menu selections. Note that menu selection 9 does not appear on the *Scripsit* menu, but it is there.

Option 2 at the main menu allows you to run a program. To get to the next menu of *Color Dictionary*, select option 2, then type "CHECK" [ENTER] and the second menu will appear. Its choices are: 1) Lookup; 2) Check Spelling; 3) Correct Spelling; 4) Go To *Scripsit*; and 5) Return to DOS. Lookup is a great feature. With it, you can search the dictionary for any word, words, group of letters, words beginning with certain letters, ending with certain letters, and so on. For example, if you wanted to see all the words that begin with the letter "z," you would enter "z*," the "*" being a wild-card character giving the whole z section of the *Dictionary*. You could also type "zoo*" or any amount of letters. The other wild character the program uses is the question mark "?." While the "*" stands for any amount of letters, the "?" stands for only one, although more than one "?" can be used in a search. A good example is if you forget the spelling of a word. Let's use the word "receive." You can't remember if the "i" is before or after the "e." You simply enter "rec??ve" and all the words in the *Dictionary* that have "rec" at the beginning and "ve" at the end and are seven letters long will appear. You could have also typed "rec??ve*" and words that match that are seven letters or longer would appear on the screen. If the question mark is used as the first letter, the entire *Dictionary* is searched for

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matches. (The process can be stopped at any time by hitting [BREAK].) After the list has appeared on the screen, you have the option of printing it or hitting [ENTER] to continue. One note, *Color Dictionary* does not have a section to set the Baud rate of your printer. There are two options here. One, insert a line at the beginning of the "DOS/BAS" program to *POKE* your Baud rate, or go to *Scripsit* from the *Color Dictionary* and set the Baud rate from *Scripsit* and return to *Dictionary*. This lookup feature will be a joy to anyone who does any kind of word puzzles. With a 60,000 word dictionary at your fingertips, finding the right word to fit should be a breeze.

Of course, there is another powerful feature of this program to check and/or correct your spelling from a *Scripsit* document. These are options 2 and 3. After pressing 2 at the menu, the program asks for a filename which should be on the disk you are using or you will need to switch disks before you enter a filename. The filename is assumed to be in *Scripsit* format with "/TXT" as an extension (default). After entering the filename and placing the *Dictionary* disk in the appropriate drive, the program proceeds to search through your *Scripsit* file and check each word against its dictionary. The "suspect" words (words that are not in its dictionary) are displayed and can also be printed. When this is completed, selection 3 from the main menu corrects the spelling. Each suspect word is shown and you are asked to enter the correct spelling, skip to the next incorrect word or return to the main menu of the "CHECK" program. If a mistake is made when correcting, you are given a chance to change it again, making this part of the program very easy to work with. Upon completion of all the changes, you can resave the file using the same filename or by entering a new one.

*Color Dictionary* will prove to be a great asset to any *Color Disk Scripsit* user, as well as anyone who just wants the program for finding words using the wild card character searches. Among its drawbacks are that words cannot be added or changed in the *Dictionary*, meaning it can't be customized. For us Canadians (Canuks!), the Canadian spelling of certain words has been left out. For example, "colour" as opposed to "color." It does have quite an extensive list of words, and most forms of words are included, including most plurals, which are always listed directly below the root word, although it may not be in alphabetical order.

**(Radio Shack Stores nationwide, 32K tape $59.95)**

**— Eldon Doucet**

# *DRB* Utility Is Reasonably Priced

If you own a disk system, you have probably discovered by now that the *DIR* command leaves a lot to be desired. Not only does it scroll the file names off of the screen, but it also does not give you all that much information about your files.

The latest offering to tackle some of these shortcomings is *DRB (Directory with Bytes). DRB* is written in BASIC and will work on a 16 or 32K machine.

When you *RUN DRB*, it asks you if you would like your directory displayed on the screen or printer. If you choose the printer option, the program checks to make sure that it is ready. If it is not, it will let you know and then *END* itself.

The directory display produced by *DRB* includes the information you are used to, plus it will show you how many bytes long each of the files are. If the screen should fill up while displaying the directory, the program will pause and wait for you to hit the space bar. Once all of your directory is displayed, the program will also display the number of free and used files, granules and bytes on the disk.

When I first ran *DRB*, I thought to myself, "Oh, that's nice," and decided to try it out on another of my disks. When I typed in *RUN* again, all I got was an OK. It was only after loading the program again that I discovered that it does a *NEW* after it is done. Why, I don't know.

*DRB* comes with another program called "DSKNAM." What this program does is allow you to put a name on your disks, which will then be displayed along with the directory. It does this by storing your name in the last eight bytes of track 17, sector 18, which is not used by RS DOS.

All things considered, *DRB* is, at best, an interesting utility program. Despite the fact that it is very reasonably priced, most of you could probably write it yourself in an hour or so. If you have never written a BASIC program, and have never read your disk system owner's manual, then you might want to consider buying it. Otherwise, a "do-it-yourself" project would be your best bet.

**(Micrologic, Box 193, First Ave., East Brady, PA 16028, 16/32K cassette, $7.95)**

**— Gerry Schechter**

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# Cultivate Action, Fun With *Demon Seed*

With such a large amount of software available for the Color Computer and so many variations of each, it is sometimes difficult to decide on what to purchase. In the area of popular arcade games, there can be as many as six or eight different versions from assorted companies, so you can flip a coin to decide what to purchase or, instead, pick up *the Rainbow* and go through the reviews to help you make up your mind. So pull up a chair right next to me and we'll boot up this program together and take a look.

Computer Shack has released a new arcade game called *Demon Seed*. The object is to protect the world from the demonic forces that want to take over the universe, or something like that. You, brave warrior, must (as usual) save the (pick one of the following): world, cosmos, earth or your pet hamster from this evil. Do you have what it takes? Are you ready? Can you handle it? Do you want to turn the page?

When the program appears on your magic tube, the first thing you will see is the title screen of *Demon Seed*. If you would like to watch the demo mode for awhile, just leave it alone. Otherwise, hit the [ENTER] key to begin the game. As the game unravels the first wave of bats will swoop down on you against a black background. You may fire upon them by pressing the button on your joystick, or defend yourself with the available shields by moving the stick forward. When you bring up a shield you become immobile for awhile until the energy of the shield wears off. The shields last about six seconds, so be ready to move again. You can fire through your shields if you want. Also, the amount of shields given to you are unlimited and you don't have to "save" them for the harder rounds.

During this first wave you may only have two shots on the screen at any given time. The second round is identical to the first one with the bats, but only one shot on the screen is allowed. Each screen will end once you have killed off every intruder in sight.

The graphics and game play improve considerably when you reach the next level. Here, the visual effects are colorful and very smooth. Small eggs form on the screen and swarm left and right, back and forth, growing right before your eyes. Whoosh, swoosh, like a slithering snake. Then they hatch. The *Demon Seed*. Wicked wings flapping furiously, blue and red and yellow. They fire upon you randomly, quickly, sometimes machine gun-like.

They swoop down at you, on you, past you, and return again at the top of your screen. You need quick reflexes now. Shoot a wing off. Whichever one you hit grows back in a short time. If you shoot both wings off, the demon turns back to an egg. Tuff stuff, eh? If you hit the demon squarely right between the eyes you finish him off. The sound of the shots and hits are electronic. These third and fourth rounds use the same firing principle. Two shots on the screen the first time around and one for the second.

If you have survived this far, you have the privilege of blowing away (pick one): the mother ship, the flagship, your landlord or your citizenship to save face and the world.

There it sits, waiting silently, suspended in the darkness of space and your living room. Our old friends, the bats, arrive for a return engagement to hassle you. You fire at the bulkhead of the ship, putting a dent in it at best. The ship slowly starts to descend, giving you less time to avoid the shots being fired from the ship. The middle portion serves as a rotating protection device to disperse the damage you inflict, so you must continue to aim for the same spot when it comes around a couple of times to finally open up a channel and lay waste to the king baddie himself. Get in one clean shot and *whapp*! The ship explodes all across your screen and you can start all over again.

Another feature of the game is a display of the high scores of the evening. You can also pause for some fresh air or restart the game anytime you want.

I should like to point out at this time that the disk I received for review was copy-protected. When you purchase *Demon Seed*, you will not be able to make a copy for your backup files. Neither the backup nor copy commands will work. Also, as the program loads, the disk head travels back and forth at least eight times to achieve a load which I feel brings about unnecessary wear and tear on the disk drive unit. I also think the disk would wear out sooner than normal because of this.

All in all, *Demon Seed* is a good arcade game that will grow on you. It is available in 16K and 32K versions.

**(MichTron, 1691 Eason, Pontiac, MI 48054, $27.95 tape, $29.95 disk)**

**— Steve Schechter**

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# RAINBOWfest Chicago

## Seminar Program And Speakers

### Ed Juge — Keynote Speaker

Ed, director of market planning for the Tandy Corporation, will be our keynote speaker at RAINBOWfest's "CoCo Community Breakfast."

### Frank Hogg — Advanced Operating Systems

Frank is the president of Frank Hogg Laboratory and a forerunner in FLEX and OS-9 systems.

### Richard Parry — Music Synthesis

Richard is the founder and owner of Speech Systems and is the designer of music and speech synthesizers.

### Linda Nielsen — Women And Computers: How And Why

Linda, of Moreton Bay Laboratory, and several others active in the CoCo area, will lead a discussion on women's involvement in computing in general and the Color Computer in particular.

### Jim Reed — Writing For *Rainbow*

Jim, Managing Editor of *the Rainbow,* will talk about how you can submit programs and articles to magazines for fun and profit.

### Charles Santee and Michael Plog — Improving Educational Software

Michael Plog is an education writer for *the Rainbow* and an educational researcher in addition to being a major partner in the Center for Opinion Research.

Dr. Santee is an education writer for *Hot CoCo* and has published poetry and curriculum as well as statistical and educational software (including *CCM#3* for JARB Software). He is a recipient of several grants and awards for educational technology.

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# *A Guide To Food Contents*
# Gives Nutritional Information

For those trying to lose weight, or for others looking to eat a balanced diet, the search for proper nutritional information often leads to piles of magazines and stacks of books. *A Guide To Food Contents* is the first attempt by a programmer to cover this area for the CoCo.

Available on tape or disk, the program requires 32K minimum for use. A one-page instruction sheet details concisely the program's operation, which is simple and direct. The program loads in three parts. The first section puts up a screen listing the abbreviations used in the program and loads "Part 1." Parts 1 and 2 run in an identical manner, showing a menu listing the food categories covered in that part, and giving the option to load the other part. Part 1 covers vegetables, fruits, meat and poultry, and fish and seafood. Part 2 gives information on milk, cereal products, cakes and puddings, spreads, etc., beverages and alcoholic drinks.

After choosing the desired food category, a listing of individual foods is given, each prefaced by a number. It is a good idea at this point to have a paper and pencil to jot down the numbers of the foods you intend to look up, as this can save a lot of frustration going back and forth from the listing to the menu to the listing and then to the screen searching for your particular food item. The listings are for the most part alphabetical, but this varies with each food category.

After you have compiled the list of reference numbers for the particular foods in your chosen category, you will be asked to enter a number, or to press [ENTER] to return to the main menu. When the number is entered, the name of the food is listed, often with a qualifying remark (boiled, fried, raw, etc). Below that is the listing of contents, as below:

```
BEEF, HAMBURGER (2.6 oz.)
cal,195
wat.137gr
pro,11.3gr
fat,15.8gr
carb,1.5gr
vit. A, folic acid, B1, B12, niacin
min, iron, phosphorus
```

Sometimes there is some minor confusion, caused by slight differences in food description (i.e., "beef, chipped," chosen from the food category becomes "beef, chopped" in the listing). The greatest problem, though, is not due to what is in the program, but what is missing.

It is possible to use this program to find information on a number of individual food items, but a number of very important items, both individual food items and even categories, are missing. In individual foods, there was no listing for skim milk, french fries or baked potatos. No mixed foods, such as pizza are given, no soups, and no breads and very little in starches. The lack of these common foods would seem to make diet planning somewhat difficult.

In testing both tape and disk versions, the tape proved easy to use, running with no problem and to my full satisfaction. The disk did cause a problem, though. The first section loaded with no problem, but when Part 1 would begin to load the disk drive would just light up and do an imitation of a Mazda (instead of going "click, click, click," it just sat there and "Hmmmmmm"ed). As I could not load it, I could not *LIST* to find the error. A friend found that by using a well-known processor (Nelson Software *Color Writer II*) it was possible to "read" the disk, and so found the problem. There was a "speed-up" *POKE* in the second line of both Parts 1 and 2. Two computers, a stock 32K "E" board and a home upgraded 32K "E" board, each had this problem, but removing the *POKEs* allowed the program to load and run. Even without the "speed-up," the program was, in effect, instantaneous, so its removal was not a detriment.

*A Guide To Food Contents* lives up to its name, providing a useful quick reference to many food items. A little more polish and perhaps the addition of some foods not included in the guide would raise this from an interesting guide to a real tool, to be used in diet planning.

**(Computing and Fitness, 35080 Chandler Ave., #80, Calanesa, CA 92320, tape or disk versions $39.95)**

**— Nevin J. Templin**

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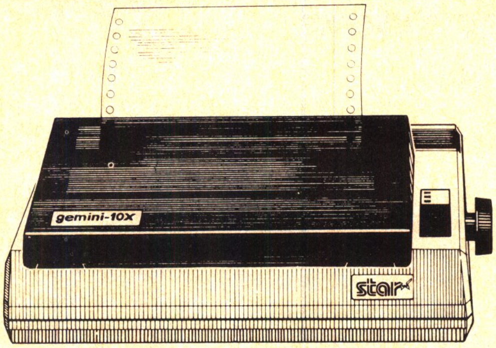

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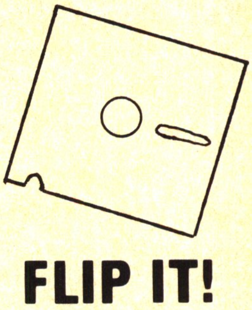

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# Business Accounting System To The Rescue

### By Bruce Rothermel

From early morn' to setting sun, this humble reviewer is the Director of Marketing for a manufacturer of power tools. The accounting functions for the company are performed by a group of bean counters and number crunchers affectionately (?) referred to as the Sales Prevention Department. They magically feed numbers into our HP-3000 Computer which spews endless reports on reams of greenbar paper. With corporate sales of over $200 million dollars, this immense accounting group is necessary.

However, after the pinstripe suit is returned to the closet, I become the President, Chief Executive, Head Honcho, Boss, and entire staff of a small home-based business called Cobra Softwear. No, that's not a misspelling. I have a mail-order business which sells Mustang and Cobra emblem La Coste golf shirts to owners of these exceptional vehicles.

What started out as a very small operation has progressed into a real business. And my previous methods of accounting — shoving bills into one drawer and checks into another —has become woefully inadequate. To my rescue has come the *Business Accounting System (BAS)* from Mark Data Products.

**F-16** ***Instrument Flight Simulator***

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The *BAS* is a family of programs which operate interactively. They require a CoCo with at least 32K RAM, and 80-column printer and at least one (two preferred) disk drives.

On loading *BAS*, the Mark Data Super Screen program is executed converting the TV screen to a 51 character by 24 line display, a great improvement over the standard screen. The operator is presented the program menu, which lists the options available to the user. When a task is selected, the CoCo loads the program to handle that task from the system disk. This modular system reduces the amount of memory required. When a transaction is completed any pertinent data is automatically transferred to the data files of the other programs in the *BAS*.

Using *BAS*, you can create, update and maintain data files and prepare the necessary accounting reports including transaction journal, a P&L or income report, and an interim or trial balance and a balance sheet.

Operation is similar to standard manual accounting procedures with the CoCo providing assistance during each step. An understanding of accounting fundamentals is helpful; however, the documentation and self-prompting screens walk the user through the basics of getting the system going.

The system is shipped with dummy data loaded on the disk. The first part of the 31-page instruction manual takes you through the basics of starting the system, entering transactions and printing reports. After getting familiar with the system by working with dummy data, you get into the meat of the program by customizing the supplied Chart of Accounts for your business.

The Chart of Accounts then becomes the heart of the accounting system. A Chart of Accounts is supplied which is so complete that it could be used by many businesses without change.

I found that is was too complete for my needs. I didn't need all the accounts furnished so I deleted many of them and added a few to meet my specific use.

The Accounts are grouped into the following classifications:

Assets
Liabilities
Equity
Sales
Cost of Sales
Operating Expenses
Other Expenses

This accounting system observes the rule — the sum of all assets must equal the sum of all liabilities plus the sum of all equities. Each transaction must affect two accounts. The computer insists on it. In fact, the message "Assets = Liabilities + Equity" is displayed at the top of the screen as each data record is reviewed.

While the 10 programs included in *BAS* interact with each other to create one system, an explanation of each program may help you to understand the capabilities of the total system.

1) START — reserves the required disk buffer space and calls the SETUP.
2) SETUP — program which sets up proper printer operation and loads and executes the Super Screen program. SETUP then requests the "workdrive" number 0

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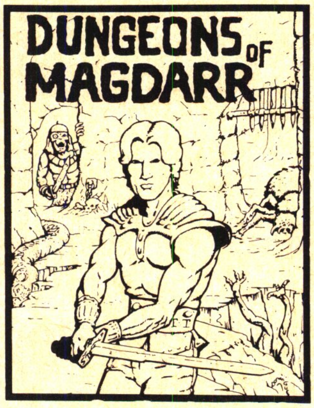

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Available On: TRS80C 16K, CMD64, VIC20 13K, MC10 16K, TI99 (EXT. BASIC), IBMPC

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**STARFIRE** - If you enjoyed StarRaiders or StarWars, you will love Starfire. It is not a copy, but the best shoot-em-up, see them in the window space game on the CMD64 or TRS80C. The fantastic graphics will put you right in the control room as you hyperspace from quadrant to quadrant fighting the aliens and protecting your bases.

Available On: TRS80C 16K, CMD64

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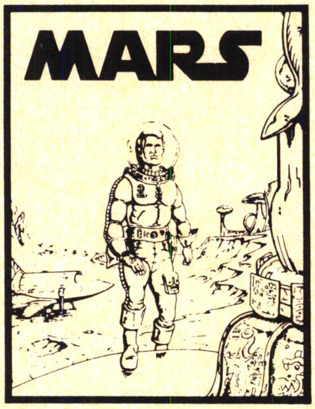

**MARS** - Your ship crashed on the Red Plane and you have to get home. You will have to explore a Martian City, repair your ship, and deal with possibly hostile aliens to get home again. This is recommended as a first Adventure. It is in no way simple - playing time normally runs from 30 to 50 hours, but it lets you try out Adventuring before you battle the really tough ones. Full Graphics Adventure.

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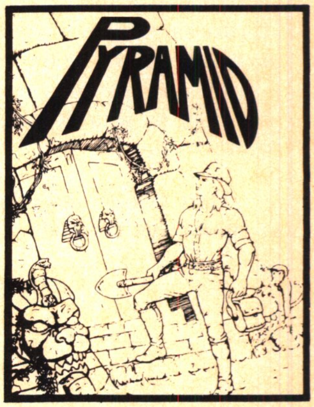

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for single systems, 1 for dual disks. The workdrive is defined as the disk drive to which all accounting data is stored.
3) DATESET — enters the current date.
4) MENU — ties all parts of the accounting system together giving you a choice of:
5) TRANSACT — The transaction program.
Here you can:
  a) Post a transaction
  b) Post a check
  c) Reviews a posted transaction
  d) Return to main menu
6) PJOURNAL — prints out a listing of every transaction stored in the file. Each page is numbered and you have the option of clearing the Journal file at the end of an accounting period.
7) PINCOME &
8) PBALANCE print a formatted balance sheet. They compare to see if Assets = Liabilities & Equity. If not, the
9) CHARTFIX program is called so you can catch the error.
10) NEWFILES will probably be used only once to set up your company name, address, etc., and to set up your custom Chart of Accounts.

The actual operation of the *BAS* program is easier to do than explain.

My little shirt business is now set up on *BAS* and a biweekly run of the system will help me keep one of my New Year's resolutions — to get organized. It will also be of great value at the end of the year when tax time rolls around. My accountant will love the printed reports and a running audit trail for all sales and expenses.

The only difficulty I encountered was that the Super Screen program included in *BAS* is not documented. Error messages are given in numerical code rather than in the two-letter alpha code the CoCo usually uses. Mark Data has stated that a listing of the error codes will be included in future shipments. I would prefer full documentation, but an explanation of the unique error codes is a help.

The *Business Accounting System* is not inexpensive, but considering what it can do to organize a small business, it is quite a value.

**(Mark Data Products, 24001 Alicia Parkway, No. 207, Mission Viejo, CA 92691, 32K & one disk drive, $99.95)**

# *Number-Kruncher*
# Good For Basic Math

When I first unpacked my Color Computer, I typed in a program called "Drawing Board" from the Radio Shack manual. This program makes colored lines on the screen when you press the arrow keys. My wife's unappreciative comment was: "Wonderful, now we own a $500 Etch-A-Sketch."

The program *Number-Kruncher*, from Moonshot Acres Software, is sort of like that. It gives your several hundred dollar computer system all the power of a $10 pocket calculator. *Number-Kruncher* allows you to key in a number, select an operation, and then key in a second number. The two numbers and the answer are all displayed simultaneously in a box in the center of the screen. It requires 16K of memory and Extended Color BASIC.

While you might sometimes want to use your computer like a calculator, this program is too limited to be useful. First of all, it has only the four basic functions: addition, subtraction, multiplication and division. No square roots, trig functions, or other advanced features. Second, the format of numbers used is very restrictive. Numbers may have, at most, six digits to the left of the decimal point and, at most, two digits to the right of the decimal point. The program does permit chaining of operations and can hold one number in memory. The program provides several screens of instruction and help screens to remind you how to use the program.

The documentation suggests that you might want to incorporate this program into your own software. One suggestion is to use it as an on-screen calculator for a financial application, like an income tax program. But *Number-Kruncher* is too limited to do even the simple calculations you'd want in an income tax program. For example, the income tax rate in my state is 2.2 percent. Since you're only allowed two digits to the right of the decimal point, you can't multiply by .022, and so you can't calculate the state income tax.

All in all, I can't imagine any reason to buy this program.

**Editor's Note: Moonshot Acres Software advises us that a percent function has been added to *Number-Kruncher* and that present owners are being mailed patch instructions.**

**(Moonshot Acres Software, Route 1, Box 423, Rockfield, KY 42274, $7.95 on cassette, postage paid)**

**— David Finkel**

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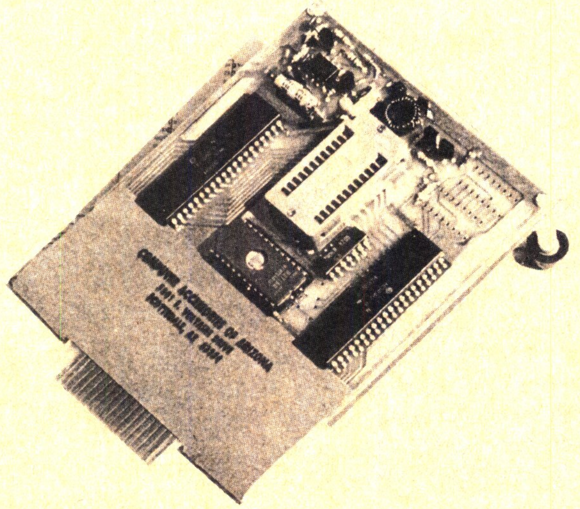
A PIA port is also available on the programmer. This 8 bit parallel I/O port with handshake lines, can be used for many applications, such as a parallel printer port. Details on how to use this port as a printer interface are included in the instruction manual.

The instruction manual describes how to take full advantage of the power of this versatile programmer. We think you'll agree, that never before was an EPROM programmer so easy to use, and feature packed as is the 1248-EP.

The enhanced 1248-EP costs only $129.95.

Firmware upgrades are available to our previous 1248-EP customers, in EPROM, for just $29.95.



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✲For robotics!

The A/D-80C is software programmable up to a maximum of 10 bits of resolution. The number of channels can be expanded beyond the 16 channel capability supplied, and the channels are software selectable.

The A/D-80C performs nearly 9K A/D conversions per second.

A generous area of the board is designated for wirewrapping to permit customization of analog signal processing circuitry.

Extensive documentation is provided to assist the user in the development of his application. Software listings are provided as an aid to software development, and a socket is provided for an EPROM for user developed software drivers.

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# *Beam Rider* — A Colorful, Energizing Chase Game

Spectral Associates has done it once again folks. *Beam Rider* is not only pleasing to the eye, but is also a lot of fun to play. Because of the many different ways that one can play the game, young and old alike will find it hard to stop trying to find new screens, gain higher bonus scores or to just see how long they may be able to survive.

As is the case with all of Spectral Associates programs, the loading instructions are very clear and easily understood. You will need at least 16K RAM (Extended BASIC is not required) and one joystick. If you are using a cassette system, type *CLOADM* and [ENTER]. With a disk system type *LOADM* and [ENTER]. When you receive the OK prompt type *EXEC* and you will be presented with the title screen, which is also the high score screen. To begin play, push the fire button on the right joystick and you will be jumped to the first screen.

Each screen or board contains blocks (blue) arranged in different patterns that must all be cleared off before one can proceed to the next board. Each board also has three characters:

1) The beamer (white solid circle) which you control with the joystick.
2) The red chasers, which follow your beamer around the board attempting to get in your way whenever possible. Coming into contact with one of the chasers when your beamer is not energized will destroy the beamer. On the first board there is one chaser, while all of the rest have two. The chasers start off slowly, but as you clear the blocks from the board, they get faster.
3) The spinner (white spinning circle) which moves about the board at random. If your beamer or the beamer's energy beam contacts the spinner in any way it will destroy your beamer. Whenever the spinner touches one of the blue blocks, the block becomes multicolored and for a few seconds (while it is still multicolored), it will be an energizer.

Clearing an energizer causes your beamer to become energized. While you are energized all point values are doubled and the chasers cannot destroy your beamer. While energized a bar will appear at the top of the screen. This gives you about seven seconds of energy. When this is gone, the bar will disappear and your beamer will be vulnerable again until you are able to clear another energizer. If you are able to beam through a chaser while your beamer is energized, you will be awarded 1000 points and the chaser will be immobilized for about 1.5 seconds. Each time an energizer is cleared the bonus counter will increase by one and when the current board is cleared of all the blocks, you will receive a bonus of 1000 times the number of energizers cleared. An additional beamer is given for each 50,000 points scored.

There are three basic ways to approach this game. The first is to go for only as many points as possible, not worrying about clearing boards. (I was able to score over 160,000 on the first board this way.) The second way is to clear as many boards as possible, not worrying about the amount of points scored. (A friend was able to get to the sixth board this way.) The third method of play is the obvious combination of the first and second methods. Score as many points as possible early in the play of a board and then trying to clear the rest of the board before the chasers can get too fast and trap your beamer. There is a fourth method that I have discovered, but I will not reveal it here. I am, at this writing, in a bet with my brother-in-law for the championship of the family and I don't want to give him any advantage in the final playoff!

Each board is different. I don't know how many different boards or screens there are, but I wouldn't be surprised if there were about ten. Some of the boards are good for scoring points, while others are better for just running and trying to get to the next board without dying. All of the boards have a very pleasing symmetery or design.

I particularly like the way the red chasers have a blurring effect when they become very fast. The destruction of your beamer is an event that has to been seen and heard to be believed! The sound of your destruction is like a tomato hitting the wall and as if that isn't enough insult, when your beamer is destroyed it goes to pieces, bouncing all over the bottom of the screen!

Overall, this game is easy to play and learn, but offers enough of a challenge to make any dedicated gamer an addict in one short evening. The graphics are well done and the sound effects are functional without being a nuisance. (Just don't go to pieces!)

**(Spectral Associates, 3418 South 90th Street, Tacoma, WA 98409, tape $24.95, disk $28.95)**

**— Mike Standefer**

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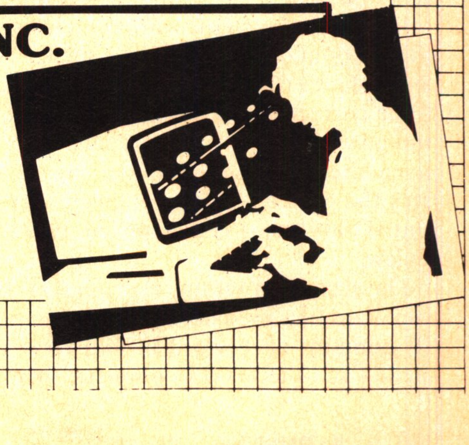

# Get The Real Sound With *Spell-A-Tron*

As voice packs for the Color Computer gain popularity and additional users, (see November '83 *Rainbow*), more programs are being released which take advantage of its speech capabilities.

For those not familiar with CoCo voice packs, a quick review. The voice pack is a ROM-type cartridge which plugs into the ROM pack slot. When a machine language program containing a text processor and a dictionary are loaded into memory, your Color Computer can then speak words and phrases contained in BASIC language programs.

The resulting speech is slightly electronic with a Swedish east-coast accent (to my west-coast ear). I refer to the resulting voice as Uncle Sven.

An ideal application of speech capability is spelling testing programs. Since the computer can pronounce the word, it is unnecessary to "flash" the word on the screen or use audio tapes which make it difficult to change the test words or the order of the test words.

Jarb Software has released their *Spell-A-Tron* program, designed to assist children in mastering their spelling words with the assistance of a 32K minimum Extended BASIC CoCo, a voice pack using a Votrax SC-01 synthesizer chip and DEI Software's *Translate* program. (For this review I used Spectrum Projects Voice Pak and included software.)

*Spell-A-Tron* consists of two separate programs. *Spelling* and *Wordmaker*. *Spelling* is the spelling quiz maker. After loading the program and a user specified word file, the following options are offered :

1) Hear and see all words
2) Hear and computer will speak all words
3) You spell the words you hear
4) Load a new word file

In the "Hear and see all words" mode, the computer will pronounce the word, display it on the screen, and pronounce the word again.

In the "Hear and computer will speak all words" mode, the computer will pronounce the word, then display and pronounce each letter, and then pronounce the word again.

In the "You spell the words you hear" mode, the computer will pronounce the word to be spelled twice and then accept the student's response. Pressing the [/] key repeats the word. If the correct spelling is given, the student is congratulated and given the next word to spell. If the incorrect spelling is given, the student is asked to try again. After three incorrect tries the correct spelling is given. After all words are presented, all incorrectly spelled words are displayed for review.

The second program, *Wordmaker*, is used to create custom word files used in the first program, *Spelling*. The word file contains each word in two forms, the word correctly spelled and the word in phonetic form. *Wordmaker* offers the following options:

1) Enter spelling word
2) Find a word
3) List word file
4) Sort word file
5) Create word subfile
6) Load word file
7) Save word file

The enter spelling word mode is the main workhorse of wordmaker and offers the options of:

1) Enter pword
2) Save pword
3) Speak pword
4) Delete pword
5) Main menu

Pword means phonetic word, the string that is passed to the voice synthesizer. In most cases, the spelling word and pword will be spelled the same, however some words have to be misspelled for them to sound right when spoken. Television is tell-a-vision phonetically. Using *Wordmaker*, the word is pronounced and you just change it until it sounds right and then save it.

*Spelling* and *Wordmaker* can hold up to 200 words in each file.

A textfile called *Tronlist* is included on a separate tape. It contains about 200 words in the sixth grade to adult category.

In use, the program works fine. The student is asked to spell the test word which is pronounced twice. The ability to repeat the word by pressing the [/] key is very helpful. On some words in the *Tronlist* file, I had difficulty determining the pronounced quiz word. Vowel sounded a lot like foul. To eliminate these sound-alikes, I used *Wordmaker* to change the pword to overemphasize the accents and add spacing. Submarine became sub-ma-rine. It is very easy to play with the pwords until they sound right to you.

I just returned from a trip to many cities across the country. After sampling speech patterns in Boston, Dallas, New York and Los Angeles, I am sure different pwords will be used in different areas of the country for the same spelling word. I found the different speech patterns to be delightful. Here in California, a "Yawl" is a fore-and-aft rigged sailboat, in Texas the same pword is used as a greeting, i.e., "Y'awl have a good day!" What I am trying to get to is that you can have your CoCo pronounce the word the way you say it.

In summary, *Spell-A-Tron* does a good job of giving a spelling quiz. It does not keep score; proper spellings are rewarded with "Right," "Correct" and "Super" responses being said to the user. The only improvement I would suggest would be adding some interesting graphics to the screen to hold the interest of younger students.

**(Jarb Software, 1636 D Avenue, Suite C, National City, CA 90250, $28.95 compatible w/disk or tape, Votrax Pak & 32K Extended BASIC required)**

**— Bruce Rothermel**

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For fun, (and this requires no ML experience), use Peeper with arcade games, watching the fine details of the animation effects in slow motion. See how the game looks and plays in other graphics modes. Or watch what is happening on "hidden screens" you never see. (Makes a superb demonstration.)

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Tape-Dir is a basic program used for displaying and/or printing information about cassette files.

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3. M/L Start, End, and Execute addresses.
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- Supplied utility will print from tape, convert the tape to a disk file, print the converted disk file, and print multiple copies of either the tape or disk (multiple copy function cannot process files greater than 14,790 characters)

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# New Friction Option For Printers

When I was deciding to buy a printer, one of the most important aspects that I had to consider was whether I wanted the "Friction" option. All printers have the usual "Tractor" mechanism, and if you desire the added convenience of using single sheets of paper, such as stationery, your personal letterhead or whatever, the cost is usually around $100 extra.

Now, for those of you who have bitten your fingernails away completely because you now wish you paid the extra scratch for the friction feature, a cheaper (but sturdy) way to get the same results is available for *any* printer. It's called the Paper Tractor.

The Paper Tractor is a flexible plastic device that is inserted into your tractor mechanism and will carry your single sheets of paper through without any hassle.

To use this handy device, you just place the paper you would like to use in and under the half-inch folds provided on the top, right and left hand sides of the "tractor." The fit is snug and the paper will stay firmly in place. Then just thread it over your printer sprockets as though it was your usual tractor-feed paper.

You may align it at this point, checking to make sure that your print head is at the desired height on the paper. Then just print as normal.

One precaution you should take while printing is to make sure that you do not go past the end of the paper and onto the device itself, or worse, onto the platen of your printer. If your printer has a "paper out" detector, it will still function as usual.

Even though my printer has friction feed as a standard feature, I tried the Paper Tractor as described and it worked beautifully. The samples I ran were at 9600 Baud and bi-directional, which I thought might have had a negative effect because of the speed and irritation to the Paper Tractor, but it came out beautifully.

After using the tractor a couple of times, I found that I could even print on the very last line of my samples since the Paper Tractor itself extends into the paper-out switch because of its length.

The only inconvenience I can imagine is that if you intend to print an awful lot, the time needed to withdraw the Paper Tractor and insert new sheets of paper will slow things up a bit.

The Paper Tractor is a handy complement for you non-friction printer owners. It handles up to 11 x 14 paper, will work with any printer, and can be used instantly by anyone. The documentation provided does not actually explain how to use it, but if after looking at the photos provided you can't figure it out, you shouldn't be near a computer, anyway.

**(Paper Tractor Ltd., 1 South Fairview, Goleta, CA 93117, $11.95)**

**— Steve Schechter**

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# *Atom* — Fast Action With A New Twist

When I took chemistry in college a few years ago, the worst part was trying to memorize the periodic table of elements. It would have been bad enough just to memorize the abbreviations of 103 different elements, but some of them (like "Pb" for lead) are based on Latin names and have no apparent connection to the common name. (My mother told me a cute way to remember the symbol for one element; when you think of antimony, think of alimony and then remember the "Sb" who's paying it.) Depending on the field you're in, you might remember a few from the names of various combinations that you come across (like NiCd for nickel-cadmium batteries or HCl for hydrochloric acid), but remembering the whole list would take a lot of work and, by the time you get all 103 down pat, a few more may well have been discovered!

Radio Shack's *Atom* is actually an educational tool disguised as a fast-action arcade game. The object is to maneuver a gravitron around a nucleus, pick up orbiting electrons and fire them into the "electron holes" on the inner ring surrounding the nucleus. By doing this, you build up atoms of different elements, starting with hydrogen and working up through the table. (For various reasons, the game uses only the first 54 elements.)

The only controls you have over the gravitron are moving it in a circle around the nucleus, moving inward and outward and picking up and firing electrons. The game's greatest problem is that the directions of movement are those *seen from the gravitron's point of view* and not the directions that you see on the TV screen. This makes it very difficult to move around, as the direction of movement on the screen doesn't match the direction in which you point the joystick. (Yes, I know that this method is scientifically correct; it works well if you are able to see the field from the point of view of the gravitron, but you can't.)

The manual uses something akin to a split screen; throughout the book, the top half of each page is devoted to a lesson about the structure of atoms while the bottom half contains the game instructions. Another nice touch is the large wall chart of the periodic table, done in a science-fiction style with the symbols placed in a picture of an atom complete with a gravitron "gunship" carrying an electron.

*Atom* would be a terrific game if the controls were easier to handle, but as it stands it takes a lot of practice just to keep from crashing.

**(Radio Shack stores nationwide, cat. no. 26-3149, $19.95 ROM Pak)**

**— Ed Ellers**

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# The *Sourcerer* Bares All

A lot of the more advanced hackers have a great interest in finding out how a particular program works. With machine language programs, the only way to find out is to disassemble the program (unless you have the extremely rare talent of being able to decipher code in your head). One guy I know has file drawers packed with disassembled listings of every program he has in his library. (I'd hate to have his bill for printer paper!)

*The Sourcerer*, from Computerware, is billed as "probably the most powerful disassembler" for the CoCo. It is capable of sending its source code to the screen, printer or tape or disk files. In the most basic operation, you simply specify the starting and ending addresses and let it rip. The resulting source listing can be entered into an assembler to regenerate the program that you are dealing with. If (and it's a big if) you can figure out the workings of the program, you can modify it to suit you and then reassemble it.

One flaw common to all disassemblers is that they can't tell whether a particular section of a program is actually machine code or if it's a table of messages, values or whatever. *The Sourcerer* has a Zap mode that finds those areas that are not valid 6809 machine code and displays them; you will still need to figure out what they are (and which "valid" instructions really are not) yourself. The Long mode gives you a listing of the machine code together with the corresponding assembly instructions, while the Symbolic mode gives you the assembly statements only (which is the way that you would enter them into an assembler).

The cassette version (which I tested) comes with a program called the *Apprentice*, which simply finds the loading and execution addresses of a binary file from tape or disk. The disk version has a *FIND* program which does the same thing as *Apprentice* and a *COMPARE* program that checks to see that two files are identical and prints a table showing where they differ.

*The Sourcerer* is a very effective disassembler for the CoCo and should be a great help to any assembly language fanatics. Those of you who use OS-9 will be happy to hear that an OS-9 *Sourcerer* is also available.

**(Computerware, Box 668, Encinitas, CA 92024, $34.95 tape, $39.95 disk)**

**— Ed Ellers**

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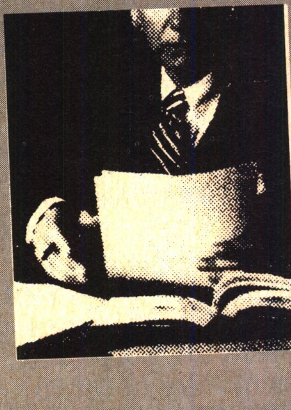

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# *Taxi* Ride Fairly Smooth

Children's Computer Workshop has developed a series of programs for Radio Shack with a goal " . . . to create software that is wholesome and engaging, encouraging children to play constructively and learn actively." *Taxi* is one of the games in the seven- to 10-year age group focusing on cooperation and strategy. The three- to six-year-old series is for " Basic Pre-School Skills" and the 10 and over series stresses "creative exploration."

*Taxi* is designed to allow one or two players to drive around various cities while picking up fares, earning payment and getting tips.

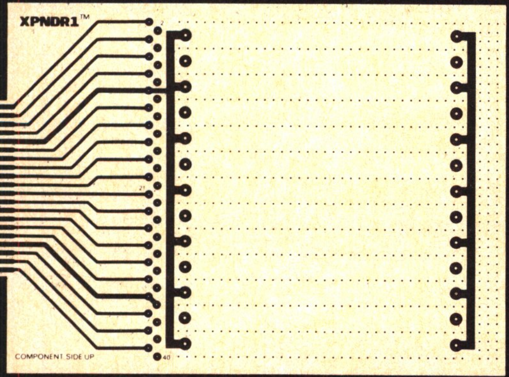
The game is suited to one player but is designed for two children to develop an understanding of cooperation and strategy in picking up their fares and thus earn more money and higher tips. The two-player "company" works towards a higher score through cooperation — helping each other with spotting fares, dividing up the city into sections and driving carefully without running red lights and getting fined or getting into accidents.

Trying out the game with two sets of youngsters (David, 10 with Mike, 12 and Jennifer, eight with Sarah, eight) gave me insight as to whether *Taxi* does what it claims. It does. Both sets of children truly enjoyed the game and did start developing a system to make more money. Cooperation was evident from explaining the introductory instructions to each other to playing the game. The first time around, an adult was needed for suggestions. But after that the children were on their own.

The game design, with high resolution graphics and sounds, is excellent. The children were enthusiastic in playing and kept at it to improve their scores.

The program, as good as it is, has some problems. These problems deal not with the game, but with the execution. The worst of the problems is the loading time. The introduction loads in a respectable 28 seconds. When *RUN*, a poem and then a high resolution taxi picture are put on the screen while *CLOADing* another 28 seconds. The directions ask if you want instructions. If you answer yes, it takes almost a full five minutes to load. The children had a hard time controlling themselves waiting this length of time. Remarks such as, "This tape is too long" and "I don't believe it" were made. In a classroom setting a teacher had better have something for the children to do during this load. At the end of the load (providing there are no I/O Errors), the screen asks a series of questions. How many players? Do you want to practice? We practiced and the program gave a sample screen of city blocks, taxi, and fares to pick up and where to drop them off. The practice is almost a game by itself. The child also learns how to position the joystick to drive and pick up passengers by centering it (the new self-centering joystick by Radio Shack would be good in this game). When the practice is completed, you have the choice of practicing again or continuing with the game. We continued and it

**Documentation For A Bare Breadboard...??**



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took 32 seconds to load the game introduction. You are then asked a series of questions, including how many players, taxi speed, what kind of traffic, long or short game. You have choice of three cities, Dallas, New York, and San Francisco. Since this is on tape, it is wise to go in numerical order, otherwise you are instructed to rewind the tape and start over. The city loaded in at 23 seconds and then the high resolution graphics loaded in at about 45 seconds. We could then start the game.

The screen shows the city on the top five-sixths of the CRT and the bottom one-sixth includes a game time (about three minutes), plus a separate fare and tip total for each player. When the game is over, a chart shows how well each player did and shows gross total minus fines, for net total of the company. You can also get a chart of the individual player's totals.

The next fault with *Taxi* is the instruction booklet. The authors did a superb job of drawing high resolution graphics of the cities. Being an ex-New Yorker, I spotted the Empire State Building, Kennedy Center, the Twin Towers and St. Patrick's Cathedral. I've been to San Francisco and recognized landmarks there, though I cannot name them. Dallas, well, I can tell you J. R. is not included. And this is the flaw. Nowhere in the instruction booklet is there an explanation of the city graphics. What a shame! Even the streets are modeled after the street designs of each city.

The booklet, while going into excellent detail about loading and playing the game, and even activities, does not mention how much RAM is needed. My CoCo is 64K but I do not know if this game will work on a 16K machine. Extended BASIC is required. But do not have your disk plugged in or the game will not work. The game uses auto-start and will cause problems with a classroom networking system. With such a long loading time this would cause difficulties for a teacher having to load computers individually from a recorder.

My general overall feeling towards *Taxi* is positive. My recommendation is that it is worth the money. However, I hope the authors develop future programs that will be disk driven, and include complete explanations for directing and graphic screens.

**(Radio Shack Stores nationwide, tape $19.95)**

**—Michael F. Garozzo**

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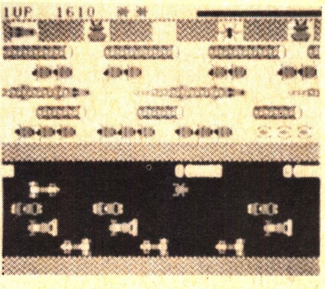

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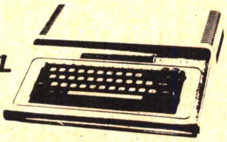

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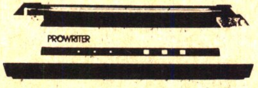

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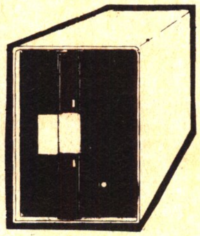

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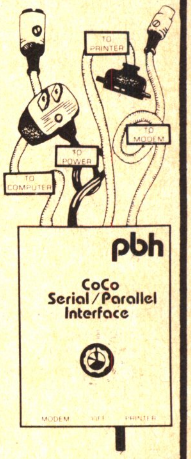

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# Responses To Queries In *Question And Answer*

There are many programs on the market that drill children in addition and subtraction. *Question And Answer*, from Moreton Bay, not only acts as a drill, but an actual teaching tool. It works with the concepts of numbers that are equal, greater than and less than, as well as providing practice in addition and subtraction. There is also instruction in the computer techniques needed to answer the questions. *Question And Answer* is actually a series of programs, each dependent on the skills learned in the preceding program. It is written for a 16K CoCo with Extended BASIC.

The first program in the series is called Step 1. In this program the child learns how to use the program and also the kinds of responses that he will need. Practice is provided in completing simple numerical equations like X + Y = ?, in which the child enters a number, or in deciding if a number is equal to another number or greater than a second number. This is done through the keying in of True [T] or False [F]. Step 2, the next program, is like Step 1 except the concept of "less than" is introduced.

Step 3 introduces more complicated problems in which the numbers before the equal sign are to be entered, e.g., ? + Y = Z.

Step 4 instructs the child on how to enter the symbols =, > and <. The problems can now take on the form X + Y ? Z or X - Y ? Z.

The last program is called QAA. It is a summary program which incorporates all the instructions and practices all the skills used in the first four steps. In Steps 1 through 4, the numbers are all one digit. In QAA, the numbers can be up to four digits long, depending on the skill level.

After *CLOADing* and *RUNning* the chosen program, the user is asked to wait while the rest of the program loads, after which he is asked to [ENTER] his name. He then has the choice of being instructed on the skills and keys needed to use the program or proceeding to the mathematical problems. The skills are taught in a clear and concise manner and the child cannot go on until the questions are answered in a way that shows conceptual understanding. I find the example used to teach a child what "True" means, unfair to many children. If the child using the program is named Johnny, the statement "Johnny loves Santa" is displayed. The child is expected to respond with "True" [T]. If he does, a screen appears that says, "Santa loves Johnny, too!" There are many children for whom Santa Claus is not a part of their life. A response of "False" [F] to this statement produces a screen which displays, "I'm so sad Johnny doesn't love Santa." I feel that this kind of statement produces feelings of being an outsider for the child who does not believe in Santa Claus. I think a more appropriate and universal statement should have been used.

When the user gets to the part of the program in which he has to solve problems, after the problem is displayed on the screen, he is told what kind of answer he needs to input. For example, if the problem is 3 + 4 = ?, he is told to respond with a number. If he answers correctly, a screen appears which graphically displays "RIGHT!" or a happy face. An incor-

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rect answer produces a graphic "NO!" (rather harsh) or an unhappy face. After every five problems, a scoreboard appears. To end the use of the program, "S" is inputted when a problem appears. This causes a final scoreboard to be displayed.

The documentation recommends that if the child is a beginning reader, an older child or adult will be needed in getting the young child started. After the child has mastered the concepts being taught, he should have no trouble using the program by himself.

There is no limit on the time needed to work out a problem. A child should be encouraged to use paper and pencil or any other tools he may need in order to find the answers. In the last program, QAA, the child or the adult can choose an appropriate skill level. A number between 1 and 1000 is entered. This is a bit much. It is difficult to distinguish the difference between skill level 250 and 251. However, it's nice to see a program that allows a child to work at his own pace and at his own level.

According to the documentation, the correct answer will be displayed after an incorrect answer has been given. Unfortunately, this is not the case. Learning is definitely lost when a child cannot find out what his mistake was.

Another flaw in *Question And Answer* is that when the answer requires a number and characters other than numbers are entered, the answer is considered incorrect. I would much rather see an error message displayed and the problem repeated. It is just too easy for little fingers to hit the wrong keys by mistake.

I especially like the fact that teaching a child how to use the computer is incorporated into the program. There is so much learning going on in these programs that I found myself overlooking most of the things that are wrong with them and concentrating on all the things that are right.

**(Moreton Bay, 316 Castillo Street, Santa Barbara, CA 93101, tape $17.95)**

**— Stephanie Snyder**

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# *Math Invasion*
# Adds Up

Having three grade schoolers, I can appreciate the value of a good educational program, and that is definitely the category for this program.

*Math Invasion* is loaded by an auto-load, auto-start program. Anyone who has bought much software has seen this loader. The title screen is displayed while the program loads, and from the title page the computer starts a demonstration of how the game is played.

Once you have seen the computer play the game, you can try yourself by touching any key. This leads you to a menu to select the home galaxy of the invaders: Addition, Subtraction, Multiplication or Division. Once this is done, you must select one of three skill levels. Now you can start to blast the invaders, but unlike other invader games, you must load the gun with an answer to one of the invading problems. Using the numbers on the keyboard, the answer must be fired at the proper invader using the right and left arrows and the spacebar. There are four invaders on the screen at all times trying to get to the surface of your planet. As the game progresses, they come faster and faster. One point is given for each right answer and one subtracted for each wrong answer.

Although this game uses low resolution graphics, it is an extremely fast, clean program that gets and holds the attention of the child playing the game. This simple-to-operate program gets the job done. *Math Invasion* is worth its weight in gold to anyone with children learning math.

**(Crystal Software, 6591 Dawsey Road, Rock Creek, OH 44084, $19.95)**

**— James McCracken**

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Have you ever wanted to go deep-sea diving in search of treasures lost centuries ago; the cargoes of hapless ships who set sail and were never heard from again? It's a fantasy that has infected each of us at one time or another. But the practicalities of life forbid all but a few from ever becoming deep-sea treasure hunters.

Now, however, every owner of a CoCo can become an underwater treasure hunter without ever donning a wetsuit. With the introduction of *Sea Quest*, a 32K Extended Color BASIC graphic Adventure, the armchair Adventurer can comb the beaches, explore the hurricane-sacked houses, and scour the ocean floor in search of clues to treasures that would ransom a king.

As in most Adventures, the object of the game is to find several treasures — in this case five — and return with them to a central location. Now, this is not the toughest Adventure I've ever embarked upon, but it's guaranteed to occupy several hours. To date, I've managed to find four of the treasures, but the fifth eludes me completely; I haven't a clue. I've been aggravated, puzzled, perplexed and disgusted, which, as bad as it sounds, is exactly what puzzle solving is all about. It's the quest, the mental stimulation and the sweet taste of victory that make all the aggravation worthwhile.

Besides, in this particular game I was surprised to meet up with this knife-brandishing character that, each time I tried to pass him, kept saying, "Dis be my island, mate, and I don't be liking strangers." I would almost *swear* that I ran into this guy in Miami one summer.

Both the cassette and disk versions of *Sea Quest* come in stylish packages with short, but ample, documentation printed on the backs of the packages. After all, you don't need a textbook accompanying an Adventure that even *EXECutes* automatically. The thrill of these games is in *discovering* what works — not being told. Right?

But, after all else has been said, it's the graphic screens that are the shining stars of this game. They're some of the best that I've seen. The fantastic strides that have been made in this genre of games in such a short time display clearly that their potential is only now beginning to be realized — potential limited only by the imaginations of the programmers. What's more, Mark Data appears to be on the cutting edge of the new graphic Adventure technologies. I've spent some time scratching my head over each of their releases, and I've been more than impressed with them all.

All things considered, you simply can't go wrong with *Sea Quest*. The worst thing that I could say about it is that I'm going crazy trying to find that last treasure. As for the price of $24.95 for cassette and $27.95 for disk, I figure that the time I've spent playing the game converts to around $3 an hour — and I'm by no means finished solving it yet.

If only all of life's little pleasures were as cheap!

**(Mark Data Products, 2400 Alicia Pkwy., #207, Mission Viejo, CA 92691, 32K ECB cassette $24.95, disk $27.95)**

**— Kevin Nickols**

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# *Speed Reading* The Fast, Fun Way

*Speed Reading* by B & B Software, consists of six text programs. Side one includes *A Service of Love* by O. Henry, *The Adventures of Hercules*, and *Life on the Mississippi* by Mark Twain. Side two has *The Tell-Tale Heart* by Edgar Allen Poe, *Hamlet, Prince of Denmark* by William Shakespeare, and *The Hollow of the Three Hills* by Nathaniel Hawthorne. At the beginning of each side of the tape is a number drill which is designed to improve peripheral vision, a necessary skill for speed reading.

*Speed Reading* was written for either 16K BASIC or 16K Extended BASIC. However, in the latter case a *POKE 25,6:NEW* is required.

After the user *RUNs* one of the text programs, he is asked to choose a reading speed. The parameters are between 100 and 3000 words per minute. The documentation states that the average reading speed is 250 words per minute and I found this a good place to start. The user is then asked to *INPUT* a starting page. Each page is a text screen, 13 screen lines in length. The stories range from 27 to 36 pages long. The user can start reading at any point in the story. If he enters a page number that is past the end of the story, the text begins with Page 1.

If, while reading a story, the user finds the text too slow, he can speed it up by keying [F]. This will increase the speed by five percent. Conversely, if the speed is too fast, it can be slowed down by keying [S] and this will decrease the speed by five percent. This can be done as many times as the reader finds necessary. B & B recommends choosing a speed that is faster than you can comfortably read.

When you wish to stop, depress [E] and the screen will clear. The program will then display the final reading speed.

It is necessary to understand that this is a training program. We all know that "practice makes perfect."

There is no testing at the end of the text, and the reader should be careful to monitor his comprehension as he progresses. If the story doesn't make sense, he needs to slow down.

This is not a program for young children. The stories are quite involved and very different writing styles are employed. I would estimate that a person should be at least in junior high school in order to use these programs effectively. However, the text is brought to the screen through use of *DATA* statements and the user could include new stories by doing a lot of typing and changing the *DATA* statements. Although a fair knowledge of programming is necessary, this makes the scope of the text, and of the program, unlimited.

The documentation offers many suggestions about how to develop speed reading skills, but like all self-help, material extensive and repetitive use is critical if benefits are to be gained.

If this article took you more that two minutes and 12 seconds to read, then *Speed Reading* may be just what you need.

**(B & B Software, P.O. Box 210, Jenkintown, PA 19046, tape $17.95)**

**— Stephanie Snyder**

# *Factors Tutor*
# Great With Home Computer

Factoring numbers. I can still remember those greatest and least common factors from my sixth grade math class. Some Fun! "What is the greatest common factor of 232 and nine million," my math teacher used to say. Oh sure, I finally got the hang of it, back in the sixth grade. We didn't have computers, nor did we have programs like this. Both would have helped.

It all started coming back to me when I ran *Factors Tutor* and I tried to put myself in the place of those children trying to learn factoring today.

The first part of the program gives directions on how to factor a number. There are several pages of instructions that are quite good but do not replace a teacher standing at a chalkboard explaining what to do. Not that the directions are not helpful, but factoring is confusing and you still need someone to explain what the directions are saying. Once you get the hang of it, the program's directions reinforce your understanding. I did not like the continuous music background that played while the directions were flashing before me. I know that children are apt to have music on the TV playing while studying. I do not. I like to concentrate on what I'm reading and I found that the music distracted me. In a classroom of multiple Color Computers, this musical introduction would cause problems.

The directions combine low resolution graphics and explain factors, prime numbers and greatest common factors. The program then asks if you want to pick certain numbers to factor or let the computer pick the numbers. You also have the choice of choosing a level from one to four. One is the lowest level using two-digit numbers while the highest level, four, has three-digit numbers.

If you pick level one, you get a problem such as: 28 = 1 x 28. You must then factor 28. The program first asks if the number 28 is a prime number. If you answer "no," you not only get to continue the problem but get rewarded with a happy face and music. An answer of "yes" gets a sad face and low-note sound. I could do without the low note for a negative response. The sad face is enough punishment. Besides, you cannot continue until you get it right. Let's say that you are stuck and do not recall how to factor. The program has a built in "help." Press "H" and the definition, not the answer, for the section of the problem you are working on appears. Fantastic! Now the student has to think out what he is doing and try to apply the directions to achieving the solution. The problem we started with was 28 = 1 x 28. If I answered that 28 was a factor, the program tells me not to use the same number as the problem itself and will not accept that as a factor. It then prompts me to continue. When I answer that 4 is a factor, the program asks me "4 times what number is a factor of 28." I answer "7," my response is then used in the original example and the program changes it to read, "28 = 1 x 7." The program then continues and asks me if "4" is a prime number. If not, I must factor that. The screen then shows "28 = 1 x 2 x 2 x 7." Since all remaining numbers are prime, the problem is solved and you get a happy face and Beethoven's Fifth Symphony.

After several problems are completed, the program shows a screen with the examples that you have factored. Now comes the tough part. The program asks, "What is the greatest common factor of each of the problems shown." And I thought I had finished factoring the problems! I get a pencil and paper and start to work out the problem. If I give a wrong answer the program says "no" and, fortunately, provides me with one of the numbers that can be used as a G.C.F. (Note how expert I am becoming . . . greatest common factor for you novices). I am then asked if this is the only common factor. In my problem there were several common factors and the program finally asked me which of these was the greatest. I answered properly and the program rearranged the examples with the greatest common factor first and the other factors afterwards. All with accompanying music.

The program concludes with a score of your efforts and returns to the main screen of directions.

My conclusion is that *Factors Tutor* is well done and enjoyable. The program has plenty of bells and whistles to hold the interest of the student and would definitely be worthwhile for school or home.

**(Computer Island, Dept. R, 227 Hampton Green, Staten Island, NY 10312, 16K Extended cassette $19.95)**

**— Michael F. Garozzo**

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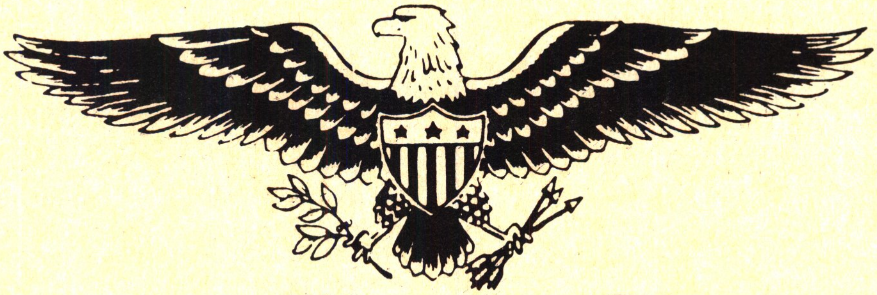

# Color Micro Journal

The Color Computer Monthly Magazine

$1.95 per issue Vol. 1, Issue 2 October, 1983

## THIS 'N THAT

The **BIG NEWS** this month is that **OS-9** has finally arrived for the Color Computer. The **ASTOUNDING** part of the Radio Shack OS-9 Package, besides the price, is the **DOCUMENTATION**. You 'Old Time Radio Shack Followers' will not believe what you see. Jon Shirley has been telling us that the main reason for the "lack" of documentation with a lot of their products was the restrictions placed on releasing that information by **Microsoft**; I

## OS-9 on the COLOR COMPUTER

One of the "Operating Systems of the Future" is **now available** for the "little old Color Computer"; **OS-9**. Freely translated, OS-9 means "Operating System for the 6809" (OS-9 is now being written for the **68000**, also). Since it is fairly obvious that UNIX and "UNIX-Type" Operating Systems will be running on just about every computer to come out in the next few years, a whole new language is beginning to appear on the horizon.

### Color Computer OS-9; the Package

We had been running a preliminary release of OS-9 on the Color Computer for a few weeks, and received the "Official Radio Shack" version for Review a couple of days ago. To put it mildly, this package is **IMPRESSIVE!** For $69.95 (Radio Shack Catalog Number **26-3030**), you receive a 9 1/2" x 7 5/8" x 2" package containing 4

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**Software Review**

# Do It Right With *Execcart*

Have you noticed lately the sudden proliferation of utilities available for our Color Computer? But you figured whatever you are doing is good enough. Me, too!

Well, in the mail the other day was a package from *the Rainbow*. In it was a utility program to backup ROM packs. So who needs a backup program to do that? Read on!

After I destroyed the CPU chip in my CoCo by accidentally removing a ROM pack from the computer while the power was still on, I decided it might be a good idea to backup all the ROM packs I own and run them from RAM.

I came up with a procedure which, while not very elegant, was effective (sort of!). It was as follows:

1) disable auto-start of cartridge,
2) save a copy to cassette (*CSAVEM, &HC000, &HDFFF, $HC000*),
3) remove ROM pack (*after* turning off the power),
4a) load the copy to low memory and see if it would run (usually not, that is why 4b),
4b) load and run my 64K RAM turn-on program,
5) load in the ROM pack copy and run it from RAM.

This system worked just fine until I got a disk drive. Turns out the disk controller and the ROM pack software both want to be in the same place at the same time. This means going back to using the ROM packs themselves, which also means I will probably catch that dreaded disk disease called I/O Error from abused connectors. Oh, what to do?

Enter the utility *Execcart*. This program, written by Peter Karwowski, does exactly what the above procedure attempted to do except it does it easier, quicker, better and even provides some features I had not thought about. It is a tape-based, ML program designed to run on a Color BASIC 64K CoCo. It comes with an 11-page manual that describes in detail every step necessary to use this program.

Its major features include making an executable backup copy of your ROM pack on cassette, instructions on saving this backup to disk, automatically disabling Extended and disk BASIC to prevent interference with the backup copy, and automatically finding the exact end address of the ROM pack to conserve cassette and disk space. Two extra features also included are the ability to turn on the 64K RAM and move all the BASIC ROM to RAM for modification and moving just Color BASIC to RAM to allow for maximum user RAM space.

The most dominant feature of this package has to be the manual. Its 11 pages are broken into six different sections. The first is an introduction which includes a brief description of the features and hardware requirements.

The second section, "GETTING STARTED," explains the setup procedure needed to disable the auto-start feature of the ROM packs. Actually, it describes two methods to do this, the first one being the preferred tape-over-pin method. The second one involves plugging in the ROM pack with the power applied and, though the warning of potential danger is adequate, I feel this method is too much like Russian roulette to be useful and should never be used.

The next and largest section is entitled "LOADING AND USING EXECCART." It is a whopping five and one-half pages long and describes in minute detail everything needed to use this program. It even goes as far as giving the listing for a BASIC program you can use to make a disk copy of a program on cassette.

The last three sections briefly describe potential problems the user may encounter with certain ROM packs and some peripheral uses for *Execcart* (as described in a previous paragraph).

I used *Execcart* with four different ROM packs and it worked flawlessly. It was also extremely easy to use. I guess all that is left to say is, if you own ROM packs and a disk drive, you need this type of program. If you have lots of ROM packs and your connectors are wearing out, you need a program like this. If you would rather be doing things the right way instead of the hard way — you need *Execcart*.

**(The Dataman, 420 Ferguson Avenue North, Hamilton, Ontario, L8L 4Y9, cassette $17.95 Canada, $14.95 U.S.)**

**— C.L. Pilipauskas**

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# This Action Game Will Grab You

You can decide for yourself whether it's the music or the arcade action from which the name *Grabber* is derived for one of Tom Mix's latest games. At any rate, it's almost as much fun to listen to the tune as it is to play the game.

And the game — a highly imaginative variation of the Pac Man type — is good, quite good. *Grabber* is the kind of quality that we have come to expect of Tom Mix, who has given us such creations as *Buzzard Bait*, *The King*, and *Journey to Mt. Doom*.

The screen is divided into two identical mazes, one above the other. As the *Grabber* is in pursuit of treasures, you move from one maze to the other with just a push of your fire button. Your object is to pick up four treasures in each of the mazes and store them in the center boxes. A white square in the opposite maze shows where you will materialize when you press your button.

The reason you will want to be transported to the other maze, of course, is because there are monsters attempting to devour you. But be careful, because another monster may be waiting in the other maze.

You can kill the monsters. When they first appear in a maze, they are the same color as you. And as long as this is the case, his touch is fatal. You can rectify the situation by running over one of the four X's that appear in each maze. This changes your color and allows you to eliminate him.

You start with three grabbers and get an extra one at 20,000 points. When you have stored a total of eight treasures (four on top, four on bottom), there's a musical fanfare and you move on to the next level of competition. Every third and eighth board of each level is a bonus board. The faster you clear these boards, the more points you will receive.

The game requires 32K and is written in machine language. One or two players may play. Hitting the [ENTER] key allows you to pause; tapping the [SPACE BAR] reconvenes the game. As with most good games, there is a high score feature that enables you to enter your tally at the end of the game — but only if your score exceeds 15,000 points.

And if you don't like the background music or if it gets old after a while, you can always turn the sound down. But I think you will agree that it puts *Grabber* a cut above most games of this genre.

**(Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI 49506, $27.95 tape, $30.95 disk)**

**— Charles Springer**

---

*Hint . . .*

# Gaining Confidence

There is an easy way to check taped programs. Simply use the *SKIPF* command. It will read over your file and report any I/O Errors *without* losing whatever program you may have in memory. Then, if you have a problem, you can still make a new save.

**Alan A. Framer**
**Charlottesville, Va.**

# *Atlantis Adventure* — A Shipshape Undersea Adventure

Yo ho ho and a bottle of rum! I, the mighty Captain Crunch, have run into a bit of a problem. It seems my submarine has been experiencing some minor difficulties — we're stuck on the bottom of the sea. I need some help and it seems nobody but you is around to help. Of course, I have to stay and eat my breakfast, so I was wondering if you could give me a hand. . . .

Sound familiar? I didn't think so. Although I modified it a little, this is basically how *Atlantis Adventure*, a new game from Owl's Nest Software, begins. As the intrepid Adventurer, your mission, if you choose to accept it, is to try to raise the incapacitated sub back up to the surface. As usual, this is much easier said than done.

Without revealing too much of the Adventure, the game allows you to travel underwater, inside the submarine, and in the city of Atlantis. The Adventure flows very fluidly, and there isn't really any place you can get stuck for too long, provided you remember your purpose.

*Atlantis Adventure* comes supplied in both a 16K and 32K game. The only difference between the two is that the 32K version has a game save and a game load feature. Also included are the instruction and loading sheet, and a small form to fill out if you solve the Adventure. If you solve the Adventure, upon mailing in your form, you will receive, postpaid nonetheless, a free game of your choice from Owls Nest. I think this is a nice way of issuing a challenge to purchasers of the game. I also like the idea of getting the free program! The game is fairly challenging, so don't expect to walk away with this prize!

The instructions to *Atlantis Adventure* are fairly complete, but it would be nice if a verb list was included. (Software companies and Adventure writers take note!) The game loads easily, and two copies of both versions (16K and 32K) are supplied on each side. The instructions also inform you that a tip sheet is available for the cost of a S.A.S.E., which is another nice touch.

I can honestly recommend *Atlantis Adventure* for any semi-experienced Adventurer, or possibly an advanced beginner. The game provides challenge for everybody and is very well plotted. If you are looking for an advanced Adventure, however, I would sail clear of Atlantis.

**(Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, 16K/32K tape $21.95 [postpaid])**

**— Eric Oberle**

---

*Hint . . .*

# Reuse That Buffer

If you have a disk system and are not using the cassette for any input/output, there is a whole 255-byte buffer area just going to waste. The cassette buffer is located from 01DA to 02D8 Hex. This is a good place to put that little ML utility

There are any number of small ML utilities that are just waiting to be placed down in this under-utilized area.

**Charles M. Thonen**
**Fort Greely, Alaska**

**Software Review**

# The Music Reader Is a Competent Tutor

By Larry Konecky

At last, music educational software is available for the Color Computer. Prickly-Pear Software has introduced a package of seven programs called *The Music Reader*. All but one of the programs in this package contain a short tutorial on one aspect of music literacy and each of them contains drill and practice on material covered in the tutorials. *The Music Reader* comes in both a tape and disk version. The tape version requires 16K Extended Color BASIC and disk requires 32K Extended BASIC.

The areas covered by the seven programs are listed as follows:

1) Notes and Rests
2) Complete the Measure
3) Note Names
4) Piano Keyboard
5) Key Signatures
6) Rhythm Practice
7) Musical Terms

With disk, access to each program is presented through a central menu and with the tape version, each program must be loaded individually.

Tutorial type instruction is normally not considered the most effective or efficient mode for Computer Assisted Instruction (CAI). Music seems to be an exception to this rule of thumb though. Learning to read music requires a complex act of associating symbols and sound in a timed sequence. Books are not capable of providing the necessary sounds for written musical examples. Home computers, however, have the capability for text, graphics, and sound presentations, separately and simultaneously. This capability is utilized quite effectively by *The Music Reader* in its instructional sections.

Even though the tutorial sections are well done they are necessarily brief, due to the limitations of 16K of memory. If you know absolutely nothing about reading music, I suspect you would have some difficulty understanding the material even though it is presented in a clear logical manner. I have found that even in private lessons learning to read music can be difficult for many persons. The programs presented in this package can be best utilized by those who are engaged in private or group music lessons at the beginning levels and would like guidance and practice at home.

The first program, *Notes and Rests*, gives a short instructional sequence on notes, rests, and their relationships. A combination of text, graphics, and sound are used to present fundamental concepts. Also contained in this program is a random drill and practice type CAI exercise. The user is given two tries to answer each question in an eight answer multiple choice format. Notes and rests, from whole through sixteenth and some dotted values, are included in the exercise. Two answers are required for each example provided. First, the note or rest name must be given and then the beat value for the same example. One problem with this format soon became apparent as I worked with the exercise. The first set of multiple choice items are listed 1 through 8 and the second set is listed A through H. If "1" is the answer to the first set then "A" is the answer to the second. If "2" is the answer to the first set then "B" is the answer to the second. The second set of answers would be scrambled in such a way that the user must know the answer in order to reach a correct response. This is an oversight which should have been avoided.

The second program, *Complete the Measure*, is a continuation of the first program. Concepts about notes and rests covered in the first program are covered in a higher level drill and practice exercise. The student must complete measures by selecting a note or rest which will correctly fill in the given measure. Exercises are provided in either $^4/_4$ or $^6/_8$ time.

Program three concentrates on naming notes on a musical staff by letter name. Learning names of notes seems to be a particularly problematic area for many beginning music students. Some music teachers have traditionally used flash card drills and practice to aid their students in this subject area. Program three's drill and practice mode emulates this kind of teaching strategy and would be a very useful program for any beginning music student. Either bass clef, treble clef, or grand staff may be selected for drill. Also, drills may be conducted with or without ledger lines. I would have liked to have seen a timed response mode in this routine, as speed of recognition is an important part of musical reading. Each of the practice modes allows students to take as much time as desired before responding.

The fourth program, *Piano Keyboard*, continues the tutorial begun by the first three lessons by introducing the concepts of accidentals (sharp, flat and natural notes). Also, relating sounds of notes to a piano keyboard is introduced.

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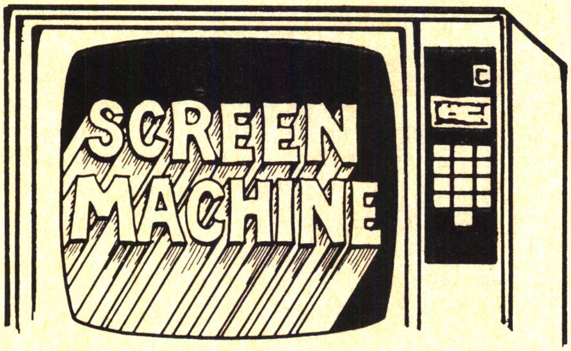

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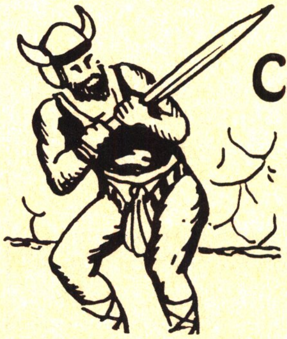

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Again, a good combination of text, graphics, and sound is used to present musical concepts. The drill and practice mode gives the student practice on naming notes of a piano keyboard over a two-octave range.

Program five introduces concepts on major and minor scales along with their respective key signatures. Again, both a tutorial mode and a drill and practice mode are provided. Either major scales only, minor scales only, or both may be drilled.

The sixth program is the only program of the series which does not contain its own tutorial section. It provides further practice on developing concepts introduced in the first two programs. This is also the only program of the package which drills the student on actual performing skills. Each of the other programs deals primarily with the fundamental knowledge and concepts necessary to read music. In this practice mode, a staff containing three measures of music is presented which the student must tap out by using the space bar. If tapped incorrectly, the program shows what was tapped in comparison to what should have been tapped. This particular program provides learning for which special teaching machines have been developed and demonstrates the versatility and usefulness which computers have in music education.

The seventh and last program of the package provides learning for 120 musical terms. It is divided into four levels of usage. Those terms most commonly used are contained in the first level and least used terms are covered in the fourth level. This program would be useful to a music student at any level. Even students at the college level could find this program useful.

It should be noted that each of the drill and practice modes of the seven programs contains various levels to choose from. Also, upon ending a drill session, an accuracy score is provided. Two tries are allowed to answer each question before it is counted wrong. The student may drop out of any drill and practice mode at any time to move on to a new program or to review any of the instructional material provided.

Overall, this package is well done and the subject material is covered in a clear and logical manner. Of particular note is the fact that seven complete programs are contained in one package (seven for the price of one). I have seen CAI programs for other computers which cover the same material as one of these, at higher prices. If you have a limited musical background or are involved in musical instruction of some kind, these programs could be of great benefit to your musical development.

**(Prickly-Pear Software, 8532 E. 24th Street, Tucson, AZ 85710, $34.95 tape, $39.95 disk)**

***Software Review***

# *Before, Between, and After* Is Quick, Fun, and Easy

**By Kenneth D. Peters**

Numbers and more numbers! Three prepositions are your game options in this number recognition drill. *Before, Between, and After* is an educational program for preschoolers through third grade that tutors your child in basic number recognition and in using numbers in sequence. I have two kids that have enjoyed using the program; a preschooler, age four and a first grader, age six.

When I first received the program for review it took only a few minutes for me to run through it to test out all the options on the menu and the "help" mode. It wasn't until I sat back and watched my kids, who were within the age group the program was written for, that I realized the value of the program's routines and the tutorial "help" mode. The program was well-written and friendly.

Graphics are excellent throughout the program and a treat to watch. *Before, Between, and After* uses auto-run to automatically load and run the program. Therefore, even though the actual number drill program is written in BASIC, you must use *CLOADM* to load the program. A title screen is displayed while the program loads, with a variation of the title screen appearing a little later if you have a 32K machine. And finally, the copyright screen appears. The copyright screen is probably the most unique to watch. In addition to the initial graphic screens shown prior to the program, high resolution graphic rewards are given for each problem completed.

Following the copyright screen the program begins with the menu: 1) Before, 2) Between, and 3) After. The drills are presented by the response to the menu: 1)Before — what number comes *before* the number given, 2)Between — what number comes *between* the two numbers given, and 3)After — what number comes *after* the number given. After selecting the type of number drill you want, you have the opportunity to select the range of numbers to be used in the drill, thus customizing the program to your child's ability. Hitting the space bar automatically selects numbers 1 to 25. [CLEAR] allows you to set any number range. For my four-year-old, we used the numbers one to 10, appropriate for someone just learning numbers. For my son in first grade we had to select a much larger range of 1000 or greater. Numbers have always been easy for my son and he seemed to buzz through the drills quite readily. Using larger four- or

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five-digit numbers seemed appropriate for him and made him think a little more.

After selecting the range of numbers, the first problem appears with the cursor positioned, according to the student's choice of drills, appropriately before, between, or after the number(s) given, waiting for your answer. Answers may be changed at any time prior to pushing [ENTER] by using the left arrow. An incorrect answer gets a brief sound and the message "No, that's not it. Try again!"

The correct answer makes the computer respond with a reward of either the American, Confederate, or Tennessee flag and will play a brief portion of an appropriate song. The program returns to the menu after 10 problems have been correctly answered. The number of the problem the student is currently working on appears at the top of the screen. The documentation also provides you with information to exit the program before the end of 10 problems and return to the menu should the student want to select a different drill or number range.

The Tennessee flag and songs are in the program because the author lives there. In fact, the author is a principal in one of the primary schools in Tennessee and has "field-tested" his programs in the school. Improvements to the program have come from suggestions of the kids and parents using *Before, Between, and After*. If you would be interested in having *your* state flag substituted for the Tennessee flag, Mr. Ben Burnette Jr. has offered to customize *Before, Between, and After* for you for a small extra charge and under two conditions. You must send him a picture of your flag and a copy of the musical portions of three or four songs you wish to use with the flag routine.

One of the flag routines in *Before, Between, and After*, the Confederate flag, has become quite popular in our house. The reason? The television series "The Dukes of Hazzard!" The author also noted over the phone the popularity of the Confederate flag and the "Dukes" in his school. Although probably not the intent of the programmer to make any reference to the television series, the Confederate flag routine is probably the most-liked reward and perhaps the biggest incentive to continue with the problems in *Before, Between, and After* so they can see the "Dukes" flag again!

My kids were sometimes disappointed when the flag didn't appear or the Dixie song did not play. Since this was a BASIC program, I was able to make a couple of changes. For those of you who might already have *Before, Between, and After* or who may purchase it in the future and might be interested in placing more emphasis on the Confederate flag and Dixie, here are the necessary changes: If you want to be sure Dixie is played every time the Confederate flag is displayed, change line 148 by eliminating the RND function for the DX value and let DX=1. The selection of the flag routines takes place at line 142. Therefore, if you want to be sure the Confederate flag always is the reward, change line 142 to eliminate the RND function and let B=1.

Perhaps the only suggestion I might have for *Before, Between, and After* would be to include an "option" or flag menu so students can select the flag they want to use as a reward. Sometimes it seemed that one or two flags were dominating the screen! That's the way random things work sometimes. You could add a flag menu in the area of the program menu and either suppress the random function or include the random selection as a fourth option in the flag menu. On the other hand, I saw my kids driven to correctly answer more questions in the hope of being rewarded with the "Dukes (Confederate)" flag and song.

One of the nice things I came to appreciate as I watched my preschooler use *Before, Between, and After* was the "tutorial mode" or "help" mode, which the child can ask for at any time by pressing [H] and [ENTER]. Both visual and sound effects are used to show the student how to arrive at the correct answer and generally include the appearance of a small sequence of numbers before and after the desired number with the correct number highlighted in bright colors and sound. After the tutorial mode is over, the child must answer the same problem correctly before he can continue on to the next problem. I think the tutorial mode has been beneficial for my preschooler in learning the number sequence. Without it, I believe she would have become frustrated or dependent on mom or dad for help. I know she used it a lot at first, but gradually got away from it as she used the program and learned her numbers. She also learned to associate the physical keyboard number sequence with the number sequence of one to 10 to make her decisions. But that, too, was only temporary and faded with practice.

*Before, Between, and After* provides a good drill of numbers in an organized, effective, and entertaining manner. The documentation is quite thorough and well written. No one should have trouble using this program. If you're shopping around for educational programs for preschool and early primary age children, *Before, Between, and After* should be considered. I love programs that are easy enough for my children to use independently of myself or my wife, except for initial and/or occasional help. *Before, Between, and After* is one of those programs.

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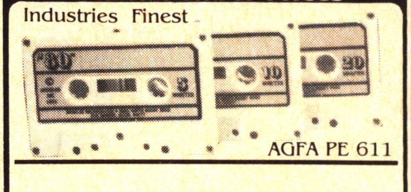

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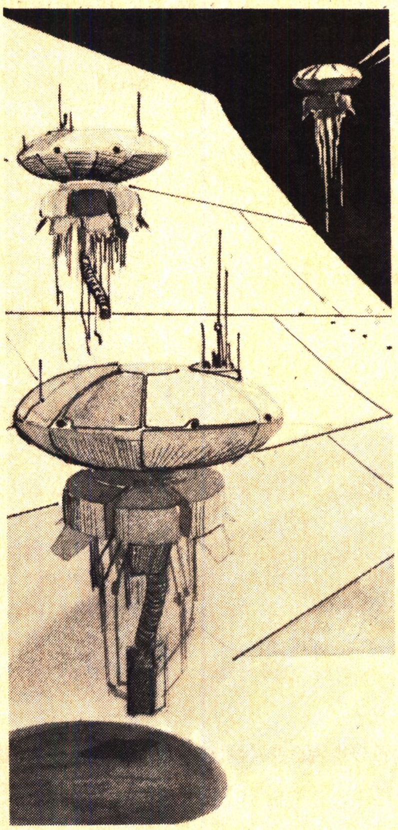

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NOPQRS
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36 point (1/2 inch) letters are variably spaced — great for flyers, invitations, signs, etc. Input up to 17 lines of text at a time; save and retrieve data.

Cartoon
7890ABCDEF
RSTUVWXYZa

# *Test-Aid* Brings Some Relief For Teachers

By Carol Kueppers

Circle the letters of all responses which apply to you:

a) I have access to a Color Computer, tape recorder and printer.

b) I frequently prepare multiple choice tests and/or questionnaires.

c) I have a master list of questions, but they must be retyped for each test.

d) None of the above.

If you circled "d" turn to something else in this magazine, this review is not for you. Those who circled any of the other choices may find the cassette-based program *Test-Aid* from Infotools well worth adding to their libraries. This menu-driven program allows preparation of data files of multiple choice questions, each having four alternative answers. Once the data files are available the program permits selection of any item for use on a printed test.

A file is first set up in the generate mode, in which questions of up to 255 characters are entered onto a formatted screen. Following entry of the question, a new screen appears, formatted with the letters a, b, c, d, and each alternative answer (with up to 123 characters apiece) is entered.

Editing is performed by the string replacement method, where the portion to be replaced is first typed and then its replacement. This allows for the correction of typos and insertion of text, but for major changes it is often easier to return to the generate mode and reenter the entire question.

The renumber mode allows rearrangement of items within the file. Unfortunately, each item must be moved individually, as there is no block renumber command. Thus, on all but the smallest files, it is far simpler to work from a master printout and make note of the appropriate groups of items.

Should you want to make extensive changes in a file, either by editing the items or changing the order of the questions within the file, it should be noted that the files created by *Test-Aid* are compatible with any word processor which can handle ASCII files. One can load a *Test-Aid* file into the word processor and perform editing or regrouping of the questions. The file lacks numbers, but it is not difficult to find individual question and answer sets. You may find this faster and easier than working within the confines of the *Test-Aid* program.

The display and select question mode allows one to either display individual items, or to rapidly "page" through sections of the file using the right and left arrow keys. Items are selected for placement in the test by depressing the up arrow key. The position of items on tests may be specified independent of their main file numbers, so that file item 40 can be

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test item 2. If hard copy of the entire data bank is desired, each item must be selected in this manner as the program does not have a print all questions option. Because paging through and selecting items is accomplished rapidly, and the main menu can be called at any time, I found it simplest to first select and print all items and then work from my hard copy to choose the questions and their order for tests.

The freedom to choose an item from any position in the file and assign it to any number on the test is an outstanding feature. Those who teach several classes of the same subject will appreciate the ease with which separate tests for each class can be prepared.

The program allows a single heading of up to 255 characters, which, oddly enough, requires the insertion of blanks if one wishes to have it centered. Considering the care with which the program is written to format the questions on the page, one wonders why the author left centering of the heading to the user. Should you wish to include brief instructions on your test, they must be included as part of the heading, as no other provision is made for the insertion of text into the test.

The print hard copy option is well thought out to trap errors before the test is printed, and is also useful in the preparation of the test itself. Before printing, both the total number of items selected and the numbers of the main file items in the order they will be printed on the test are displayed. Thus, a display of 20 2 3 indicates that main file number 20 will be the first test number.

Another desirable printing option allows for either continuous feed, or pause after each page. The printed test is nicely formatted on the page, with two spaces separating it from the heading. Once the selected items are printed, it is possible to add more items, either from the same file or by clearing the file from memory and loading in another. Thus, except for the mechanics of continuously loading in files, it makes no difference if one prepares a series of short files, or several larger ones.

The count and clear mode not only provides a count of the number of items in the main file as questions are generated, but also permits clearing either the entire file from memory, or only the "test queue." The latter option permits preparation of several different tests from the same file.

The program is accompanied by a detailed spiral-bound manual which is easy to follow for step-by-step preparation of tests. The last page of miscellaneous information contains the important notice that, one should inadvertently break out of the program, data will not be lost if *GOTO 40* rather than *RUN* is typed. This message is so important that I urge every user to add it as a footnote to each page of the manual.

Once I had tried all options a few times, I was sufficiently familiar with the commands to be able to prepare a multiple choice test quickly. Although I preferred using *Test-Aid* in conjunction with my word-processing program, this is not necessary. By making minimal use of the editing and renumbering features and working from a master printout, it is fairly easy to prepare a large question file for preparation of numerous multiple-choice tests using *Test-Aid* alone. I think that anyone who prepares such tests frequently would find this program useful and a definite time and effort saver.

Since this review was written, the *Test-Aid* program has been released in an enhanced version. It is now possible to obtain a printout of the entire file by entering a shifted up-arrow, a feature which saves considerable time over the method used initially. The program is now available on either tape or disk and supports the use of both tape and disks for storage of files, so that the user with a disk drive will find working with a series of small files very quickly. In addition, if only one file is used for selection of the test questions it is possible to specify the number of copies to be printed. There are also now two versions of *Test-Aid*, one which creates questions with four alternative answers, and one for five alternative answers. The purchaser should specify his choice when ordering.

**(Infotools, 111 Country Club Lane, Oxford, OH 45056, 32K or 64K ECB tape $21, disk $23)**

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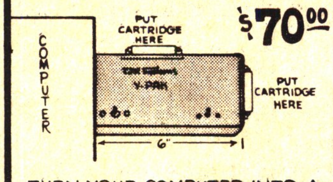

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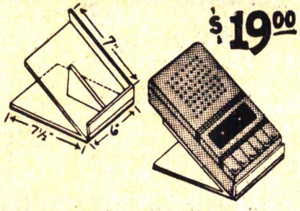

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**Software Review**

# 'Free' *Flight From Grimdar* Is Exciting Trip

"Freeware" is a concept recently originated by Andrew Fluegelman, the author of the very popular terminal program "PC TALK" for the IBM PC. By making his programs readily available, Fluegelman has attempted to revolutionize the software business. You send Fluegelman a disk and he sends you one of the best comunications programs in the industry. If you like the program, you send him a donation. Although he only advertises via the information networks (CompuServe and The Source), he has found a large following of customers who willingly donate up to $25 after sampling his fine program. More recently, advertisements from Star-Kits have offered the *Commterm* program for the CoCo, free of charge to those who send a tape and self-addressed stamped envelope. Now, from the CoCo Freeware Clearinghouse, we have more Freeware for the Color Computer.

The first offering of the CoCo Freeware Clearinghouse is Freeware Tape #101: *Flight from Grimdar*. To obtain the program, you are requested to send a blank tape (or disk) along with a postage-paid return mailer. The transaction does not involve any money, but contributions are accepted after you receive and use the program.

The program is a space-trek game which combines the elements of an Adventure with the action of a space chase. Steven Richards, the author of the Adventure, has written the game in BASIC, using both sound and graphics to enhance the action. The game requires only modest skill and intelligence to play. Even adults can play the game with a little study and practice.

The scene opens on a war-torn, smoldering battlefield. The bodies of your fellow Earth soldiers lay about you. You know it can only be moments before the fierce warriors of Grimdar begin their final assault. Your only chance for survival is escape.

While examining a mysterious device found on a dead Grimdarian soldier, you find yourself suddenly transported to the bridge of a deserted Grimdarian starship. You struggle to recall the instructions from your cadet days, when you were briefly taught the controls of various starships. Suddenly, the Grimdarians attack! No time to think! Fire up the rocket engine and blast off into space. Search the galaxies for planet Earth and safety from the pursuing barbarian hoard.

The Adventure is played in a three-dimensional grid of 27 quadrants. You move through the galaxy by specifying the speed and direction of the ship. The Grimdarians are never far behind and will easily overtake you at the most unexpected moments. The starship's fuel supply limits your range, the directions for operating the spaceship are scanty, and you are always in danger of running off the edge of the known universe.

Each game is different. The Grimdarians can seldom be outdistanced. Your goal, planet Earth, assumes new coordinates for each game. Thus, the Adventure is always challenging.

This game is not the equal of extensive Adventures and simulation/role-playing games available from the major game companies. However, as an initial offering from the CoCo Freeware Clearinghouse, it serves as a good example of what can be accomplished by an enthusiastic CoCo programmer. I think we should all support the freeware concept. I like the idea of being able to preview a program before making a financial committment. Send them your tapes and, after playing *Flight from Grimdar*, show your appreciation.

**(The CoCo Freeware Clearinghouse, P.O. Box 1084, Morgantown, WV 26507, 16K, 32K Color Computer Extended cassette or disk, send tape or disk and SASE, contributions accepted)**

**— Stuart Hawkinson**

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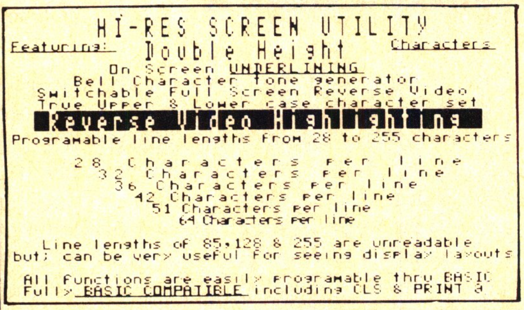

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## *TV Graphics Editor* Makes CoCo A Van Gogh

Actually, if Van Gogh had a CoCo and a copy of *TV Graphics Editor*, he probably would not have ever put a brush to canvas. This machine language program lets you draw just about anything your imagination can come up with and you don't have to worry about dripping paint on the carpet, either. Your joystick is the brush and your trusty TV is the canvas. *CLOADM* gets you started and then you are given the choice of approximately 30 different commands to choose from. These are not menu-driven but are well-documented in the five pages of command instructions and single introduction page.

You are given three resolution modes to work with. These are equivalent to *PMODE1*, *PMODE3*, and *PMODE4* of the standard CoCo system, the highest resolution being 256 across by 192 down. A unique keyboard command is *GRID*; this places a 32 by 24 dot grid across the canvas and is very helpful when proper alignment is required. Of course, the grid can be erased when you are finished with it. Another handy feature is the ability to print any character in upper- or lowercase anywhere on the canvas; numbers and punctuation are also possible. A *LINE* command lets you draw lines between each joystick-controlled cursor, and this can be fun when two people want to draw a picture together. You can also draw an ellipse or arc, choose colors to paint specific areas, exchange two colors, magnify or shrink areas, and the list goes on. It takes awhile to try all the features.

Fortunately, you can save your masterpiece on cassette, load back in whenever and enjoy or modify if necessary. There is also an option to print your picture using a Radio Shack dot matrix printer or to the RS CGP-115 Color Graphics Printer.

The manual suggests that self-centering type joysticks may be easier to use. I found the standard RS sticks adequate, but a very fine touch is needed, especially in the Hi-Res mode. This was most evident when trying to erase a line, a procedure that requires you to draw over the unwanted line. As with most tasks, a little practice goes a long way and that certainly applies here. I would also like to see a couple of pictures included on the program tape. This would give you some feel for the potential artistic talent we have at our fingertips.

*TV Graphics Editor* is a lot of fun and it's a nice break from the old game-playing routine.

**(International Software, Inc., 820 Dunsmuir Road, Victoria, B.C., Canada, V9A 5B7, tape $29.95 Canada, $24.75 U.S.)**

**— Ron Hansen**

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I could talk about the many times that I have had to remove the "source" disk, insert the "destination" disk, load, unload, load, unload, etc., forever it seems. In the process, you are risking damage to both new and old disks, and valuable programs as well.

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# Blast Out Of The Doldrums With *Galactic Taipan*

There I was playing another shoot-em-up game wondering why I bought it. Looking for some new excitement, I dove into my pile of tapes. I found an old neglected tape beneath my *Pac-Man* and *Space Invaders.* I looked at the tape and it was Ark Royal's *Galactic Taipan*. I was beyond boredom, so I loaded the program. While the 32K program loaded, I quickly scanned the instructions. I sighed and typed *RUN*, thinking *Galactic Taipan* was going to be another boring text game. As usual I was wrong and the game started with a *PMODE3* picture of my ship landing. After landing I was presented with a menu of options. I could check my cargo, go to the market, get financial help, check starmap, lift-off or buy information about other planets. The instruction told me I was a space trader trying to make a buck, so I went to the market with high hopes. At the market I found that I could buy or sell many different things such as electronics (CoCo?), weapons, medicinals, spices, art, food and fuel. Weapons were cheap, so I bought 100 and put them in my ship.

I wanted to make some money, so I checked the information on every planet. I found out that there was a war on Sirus. That meant that the people on Sirus would pay high prices for weapons! Knowing this, I checked my starmap and found that Sirus was far away, but the trip would be worth it. I nervously hit "5" for lift-off and told my computer to plot a course for Sirus. My onboard computer then asked me if I would like to go fast or slow. I chose fast because I did not want to miss the war. The screen showed me lift-off and then told me to prepare to enter hyperspace. I buckled myself in and stared at my screen waiting for action. My engines roared and the stars began whizzing by . . . then all was quiet and I was ready to enter normal space.

As I entered normal space, my screen flashed "Space storm — you took 30 percent damage." I was badly damaged, but I knew Sirus had to be near. My screen flashed again and told me space pirates were approaching. Then I knew my troubles were only beginning. . . .

This is *Galactic Taipan*. You are a space trader hopping from planet to planet trying to make money. Of course, there are many things that stand in the way of doing this. There are space storms, pirates (not from Pittsburgh), taxes, wars, plagues, and many more.

Many are now saying that this game sounds too complicated. The author covered this by writing a very complete instruction book. The instructions tell everything you need to know while incorporating a little humor.

There was only one thing that I did not like — the graphics. They were nice to watch at first, but they soon became repetitious. The hyperspace, take-off and landing graphics are always the same and just take up time. After playing the game for a few minutes, I cut the graphics out of the game to speed it up.

*Galactic Taipan* is a very good game and should provide hours of fun. For those who are experts, *Galactic Taipan* provides different levels of play. It is an excellent cross between an Adventure and a space game. So, if you're tired of shoot-em-ups, you might want to look into *Galactic Taipan*.

**(Ark Royal Games, P.O. Box 14806, Jacksonville, FL 32238, 32K tape $24.95)**

**— Steven Schweitzer**

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# Gobbling Good Fun In *Foodwar*

When I first received this game, my first thought was the game *Burgertime*. This was before I played the game or even read the instructions. I say this because *Foodwar* is nothing like *Burgertime*. It is a very unique game that, once I learned how to play, was very enjoyable. I say that because the instructions left a lot to be desired. The instructions were very basic, but after about 30 minutes on the game, the instructions became clear. An example: The instructions stated that falling in a "hole" would cost one life. Well, when the first screen appeared, I wasn't sure what the "holes" were. I will admit, I found out real soon. They were the hockey puck-looking figures that changed color. The technique of throwing food also took some work. I will inject a little personal preference here and say it would have been nice to have had a little story in the instructions to get the player really into the game.

I have one other thing I would like to see changed. After you have been killed the last time, if your score is in the top 10, your initials are requested. Next, the screen prints the top 10 scores. All of this is well and good, but then, to start another game, you push the fire button and the game starts over from the very *beginning* (drawing the title screen again, then asking what level of play is desired). Well, when I first played *Foodwar*, this was impressive. It went along with the superior graphics of the game. But after I've been killed by those nasty chefs, I want to get back to the action as soon as possible. Having to watch the title screen redraw after each game got very frustrating. Also, I always wanted to play the highest level (it has 10 levels), and I had to move the joystick over to select that level at the beginning of each game. After I had played a few hours, I turned the game over to my 10-year-old son. After his second game he discovered that holding down the fire button after the scores are displayed makes the title screen be drawn much faster. This also works at the beginning of the first game. Now the suggestion: I would like to be able to keep the same level of play by just pushing the fire button again. I would also suggest documenting how to make the title screen print faster in the instructions.

The object of the game is to eat an ice cream cone before it melts, thereby advancing to the next level. To keep you from this goal, evil, nasty chefs try to hit you with all kinds of food. This includes pies, bananas and berries. For defense, you can pick up food and hurl it at them. If they hit you with the food or if they run into you, this costs you one life. But, by carefully picking your shots and never staying in one spot too long, you can keep the chefs under control and get to your ice cream before it melts. Don't rest too long after eating the ice cream because they attack again in the next level with even greater accuracy and determination. You receive an extra man for every 100,000 points. This is not impossible to do, but don't count on getting an extra man very often.

While I wasn't impressed by the use of sound, the graphics in the game were outstanding. Michael Lustig used the available colors to their best advantage. My only concern was with the blue and orange ice cream. While the ad in *the Rainbow* stated the game had 15 screens, I didn't have time to count them while I was playing. I decided to take Michael's word for it.

I let my two sons play the game and my seven-year-old enjoyed the game even though his score wasn't too good (but then again, he doesn't care about scores anyway). My 10-year-old really enjoyed *Foodwar* and he is starting to get pretty good; not as good as his ol' man but he is coming along quickly. I would recommend this game highly, but I must add that I would like to see better documentation. I can't say anything about the packaging because the disk did not come packaged by the company.

*Foodwar* is a 32K game available on disk or tape and is well worth the price. I reviewed the disk version. Below I have rated the game on various qualities, from one to 10 with five being mediocre. By the way, don't count on seeing many tens. They are harder to get here than in the Olympics.

| | | |
|---|---|---|
| Graphics | 9 | Superior with good use of colors |
| Sound | 5 | Disappointing after seeing the graphics |
| Difficulty of play | 8 | Fast action, requiring total concentration, but playable |
| Replayable | 8 | Arm gets tired before you do |
| Documentation | 3 | Almost non-existent |

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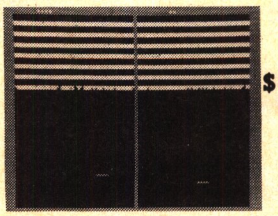

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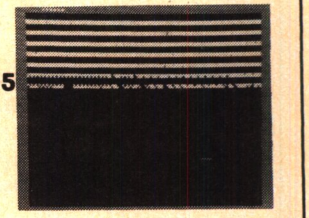

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## HOME INVENTORY BY JEFF PYNE

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**Software Review**

# *Diskutil* Is A Multi-featured Disk Enhancer

### By Frank J. Esser

The disk BASIC system supplied by Radio Shack with its disk interface is complete because it provides the user with all the necessary commands to properly handle the disk drives. However, the Radio Shack system is lacking in one area. In an effort to keep the system simple, it appears that they have made it inefficient in its interface to the user. There are many examples such as the requirement to give both the source name and the destination name when copying files from one disk to another. If the second name was missing, they could have assumed that it was to be the same on the second disk, etc.

*Diskutil* is a program written to fill in the voids and at the same time add a little refinement to the disk operation. How many times have you wished that you could control the order that filenames were stored in the dictionary? Well, wish no longer, for *Diskutil* will allow you to place the directory in any order you desire. It performs many other functions plus it enhances many of the standard Radio Shack commands and makes life a lot easier.

*Diskutil* comes on a 5¼″ diskette with no protection features. The standard BASIC *BACKUP* command will work with no trouble. The documentation consists of four 8½″ x 11″ single-sided pages. The documentation package at first looks a little skimpy, but all the necessary information is presented in a clear and concise manner. The real trick to using *Diskutil* is to get the program up and running and experiment with the different functions. In this manner you will learn quickly what *Diskutil* can do for you and how you can use it to simplify your daily operations.

*Diskutil* is run by typing in *LOADM Diskutil*. The program will auto execute, therefore you will not be required to type in the *EXEC* command. The first screen displayed asks that you insert a diskette in drive 0 and press [ENTER]. Once that has been accomplished, the directory of the disk in drive 0 is read and the main menu is displayed. The menus used throughout *Diskutil* are different than those normally used by utility programs. The menus are green characters on a black background. All the acceptable commands are listed on the screen. Each command is executed by the entry of a single character, usually the first character in the command name. Those characters which are valid entries for a given command are highlighted on the screen by flashing them between a black character on a green background and the normal menu display. This is very effective and does not distract from the screen display itself. The directory of the disk in the default drive is displayed on the right of the screen. The entire directory is displayed only if the number of entries is such that they will fit in the window displayed there. If there are more entries than will fit in the window, the window itself can be moved through the entries by using the up/down arrows. Thus the entire directory can easily be scanned. The window is the standard black characters on the green background. The following commands are displayed on the primary menu and are the command list for *Diskutil*: ALPHABETIZE; BACKUP/SUPER COPY; EXAMINE FILE DATE; FORMAT (DISKINI); LOAD/LOADM; MOVE FILENAME; SUPER DIRECTORY; VERIFY; COPY; GAT; INFO; DRIVE; HELP; KILL; RENAME; and QUIT. Lets examine each of these commands individu-

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ally since that is what *Diskutil* is all about.

The ALPHABETIZE command allows you to sort the disk directory in three ways. You can sort by the filename, extension name or file type. Upon entering this section, you are asked for the type of sort you would like. Responding to the sort prompt with a null entry will get a sort by filename. Upon entering your answer, the directory is read from the disk, sorted according to your response and then rewritten to the disk. For those of you who do not fully understand the workings of your Color Computer, the placement of the information on the disk proper is in no way linked to the position of an entry in the disk directory. Thus sorting the directory entries will not harm the data on the disk or the ability of the disk BASIC system to find it.

The BACKUP/SUPER COPY command will make copies of a given disk in two ways. You can request a sector by sector copy of your disk to be made to a second disk. This command is very similar to Radio Shack's *BACKUP* command, except it runs much faster than Radio Shack's. Upon entering this section, you are requested to give source drive and the destination drive number. If you respond with zero in both cases, you will go into the single drive copy mode.

You are then requested to place the source disk into the source drive and the destination disk into the destination drive, strike any key and the process will begin. With the verify on, it took approximately four seconds/track to complete the copy. With the verify off, it took considerably less time. In both cases, the program will always tell you its destination during the entire copy process, which is an excellent feature. The second method is the file by file copy. Upon entering this section you are again asked for the destination and source drive numbers. As before, answering with zero to both will put you into the single drive mode. Upon entering your drive numbers, you are asked if you want to be prompted before each file transfer. If you answer no, then all files are copied as found in the source directory. If you answer yes, then before each file is transferred, you are asked if you want that file transferred. Your response can be either yes, no or abort.

The abort response will abort the entire process and return you to the main menu. Thus, you can either copy your entire disk automatically or you can selectively copy programs in an interactive mode. Why would anyone really want to perform a copy in this mode anyway? The straight track for track copy, even though it runs faster, will not correct for fragmented programs on the disk. The copy on a program basis will. Thus, you may cut down on the number of disk accesses needed to load a given program. If the file already exists on the destination disk, you are given the AE BASIC error and then asked if you want to overwrite the existing program. If you respond with no, then you proceed to the next program.

The EXAMINE FILE DATA command allows you to step through any of the programs on the disk sector by sector. Each sector is displayed on the lower half of the screen for your visual pleasure. The file displayed is the one being pointed to in the directory window at the time the command was executed. All you can do from this section is view the data, you cannot modify or change it in any way.

The FORMAT (*DISKINI*) command is very similar to BASIC's *DSKINI* command. Upon entry, you are asked for the drive number. Entering the drive number, you are asked "ARE YOU SURE (Y/N)." Responding with yes will get the following message displayed on the screen, "INITIALIZ-

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ING DISKETTE IN DRIVE x." Upon completion you are returned to the main menu. Responding with a no will get an immediate return to the main menu.

The *LOAD/LOADM* command is one of the more versatile and powerful commands. Executing this command and answering all the prompts will result in either a basic or machine program being loaded and automatically executed. You do not have to worry about the drives running forever because they did not shut down before the program started, as is the case with many games. The program loaded will be the one being pointed to in the directory window when the command is executed. Upon entering the command, you will be asked, "ARE YOU SURE YOU WANT TO LOADM AND EXECUTE -------?" Once the program is loaded and executed, *Diskutil* is gone and must be reloaded when needed.

The MOVE FILENAME command is another of those very versatile commands. This command will allow you to pick any one directory entry and place it anywhere in the directory you may want it. Now what good is all that you ask? Well how many times have you saved a file to disk thinking it would appear at one place in the directory only to have the file manager find a hole somewhere else? There are some programs, such as *Telewriter-64* which are actually composed of more than one program. If you are like most everyone, you want backups to that valuable software you purchased. However, when you put it on your backup disk with other programs, it did not get cataloged in the manner you wanted. Well with MOVE FILENAME you can put the directory in any order you want. You can achieve the exact results you wanted in the first place.

The SUPER DIRECTORY command will create a list of the directory of the disk being pointed to in the directory window at the time the command is executed. The display will appear on the screen with an option to make a hard copy on the printer also. The format for both the screen and the printer display is as follows:

| | | |
|---|---|---|
| BASIC Program | – | Length in bytes |
| Data File | – | Type, Number of characters |
| Mach Program | – | Start, End, Execute Address |
| ED/ASM File | – | Length in bytes |
| All Others | – | Length in bytes |

This command is the only one which gave me any trouble. When the printer option is selected and the program is required to go back to the disk before the complete line can be printed, the printer or the program loses one byte. The lost byte does not occur all the time, but often enough to make the printed output somewhat undesirable. I tried the command on two different computers, with different printers and disk drives. The results were the same in both cases. The printers used in both cases were Radio Shack printers. Mine is a DMP-200 and the other was a LPVIII. The only draw back in an otherwise excellent program.

The VERIFY command toggles the verify function between off and on. If the verify function was off, executing it will turn it on. If it was on, execution will turn it off.

The COPY command will copy the file being pointed to in the directory window when the command is executed. You are then asked for the drive number of the drive that the file is to be copied to.

The GAT command will display the full file allocation table of the disk in the default drive. The display is in a Hex format on a checker board background. Again, this is a display only and you can only look.

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The INFO command will give a display of the pertinent data for the file being pointed to in the directory window at the time the command is executed. The data displayed has the following format:

FILENAME: – file name
FILETYPE: – 0,1,2
FILEFORM: – binary, ASCII
# OF GRANS: – number of disc granules used
GRANULE MAP: – on which of the disc granules this file resides

The DRIVE command sets the default drive number. This will be the drive accessed when a drive number is not entered.

The HELP command will bring up a limited help screen. This screen gives the BASIC command entry formats.

The KILL command operates in a similar manner to BASIC *KILL* command. The file in question will be the one pointed to by the directory window at the time the command is executed. However, before the file is erased from the directory, the prompt "ARE YOU SURE(Y/N)?" must be answered. If you answer no, you are returned to the main menu. If you answer yes, the file is killed or the entry is removed from the directory.

The RENAME command is the same as the disk BASIC command with one exception. If you do not specify an extension name, the old extension name will be retained. The file being renamed is the one pointed to in the directory window at the time the command is executed.

The QUIT command is just that. Exercising this command will return you to the BASIC interpreter and erase the program from memory. However, before performing a cold start, all disk drive heads are positioned over track 0. This stops the annoying habit of disk BASIC from banging the heads against the stops until it can determine just where they really are.

*Diskutil* is advertised as a program which will enhance the disk handling routines and make life much easier. Well it does that and then some. It provides utilities which operate in a more friendly manner than the original ones; offers the ability to sort the directory entries and move file names around in the directory to obtain the desired order; and displays information about each of the files in the directory as to type, length, and where they are actually stored on the disk. *Diskutil* allows you to step through each of the sectors in each of the files, going both backward and forward. It provides for two types of disk backup, by file or by track and gives you the ability to load and run both BASIC and machine language programs with a single command. Also, *Diskutil* gives you the ability to copy single programs without going through the hassle of having to type in the file names twice. All of this in a single program which runs smooth as silk. The only problem I encountered was the mentioned print routine dropping an occasional character when the disk was being accessed. Other than that, the program ran perfectly.

I think this is a program of excellent quality that was well designed and written. For anyone with any kind of disk library, I think *Diskutil* is a must. I have nothing but the highest regard for this program and find it an excellent addition to any library.

**(Silicon Rainbow Products, 1111 W. El Camino Real, Suite 109, Sunnyvale, CA 94087, Logical Computer Products, P.O. Box 125-S121, Arlington, MA 02174, $35, plus $2 S/H)**

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# *MDISK* Is A Good No-Disk, 'Disk' System

With the price of 64K RAM chips so low and all the available information on how to modify your CoCo to 64K memory, there is little excuse not to have a 64K CoCo. But once you have the full 64K, how do you make use of all of it? Easy! You run *MDISK*.

*MDISK* is a utility for the 64K CoCo that changes the upper 32K of memory (page 1) into a "virtual disk" system. It may be used with or without a disk drive.

With *MDISK*, you can:

1) save and load up to 15 programs within page 1;
2) display a directory of files stored there;
3) delete unwanted page 1 files;
4) run BASIC or *EXEC* machine language programs directly from *MDISK*; and
5) chain from one BASIC program to another, preserving data already created.

As an added bonus, *MDISK* will test the page 1 memory and if any errors are found, *MDISK* will help pinpoint where the problem is.

*MDISK* is a ML program that loads into the upper 2K of page 0 memory. It is written in position independent code and can be relocated anywhere within page 0. Disk BASIC is not required and it will run without changes on a cassette-based 64K CoCo.

The greatest appreciation for *MDISK* would probably be from those who have the 64K of memory but cannot afford the Disk BASIC system. We all know the frustration of having to load tape programs into memory. It takes a long time to transfer the programs and if any I/O Errors occur, then it takes more time to try and load them in again.

With *MDISK*, you still have to load the programs in from tape, but once you have them in memory, you safely tuck them away into page 1. Save up to 15 programs (provided you do not exceed the memory capacity of 32K) and then recall them into your working area as though they were coming from a disk. The transfer time is very fast and I/O Errors are effectively non-existent.

Prior to loading *MDISK*, be sure to do *CLEAR 200*, &H77FF. If you fail to do this, your system will either lock up or run wild. You will then have to shut everything down and start over again. Next, *LOADM* the program, then type *EXEC*.

A menu screen will be displayed showing all the usable options of *MDISK*. These include:

S – Save program to page 1
D – Directory of files saved
K – Kill a file in page 1
L – Load program to BASIC
C – Chain program to BASIC
R – Run program in BASIC area
G – Go to ML (*EXEC* ML program)
E – Exit *MDISK* (return to BASIC)

All of these options should be self-explanatory with the exception of CHAIN. Let's explain that one a little further.

If we load a program into the BASIC work area, two things happen. First, the previous program is wiped out and our new program takes its place. Second, all the variables used within the first program are cleared to zero or set to the "null" string if they are string variables. There is no way of passing a variable from one BASIC program directly to another. Not until *MDISK* came along.

With the CHAIN feature, the new BASIC program still replaces the old, but all the variables are preserved. The second program picks up from where the first one left off.

Unfortunately, there is a catch. If the two programs are *PROG1* and *PROG2*, and you want to chain the variables to *PROG2*, then *PROG2* must be shorter than *PROG1*. If you try to chain from a shorter to a longer program, *MDISK* either will not allow it or strange things begin to happen.

*MDISK* has two operating modes, manual and auto. In the manual mode, you call *MDISK* by typing *EXEC*. You then respond to the menu item desired, then return to BASIC.

In the auto mode, you can execute *MDISK* from a running program. This calls for the inclusion of two additional lines within the program. The first line makes a call to *MDISK* through a *DEFUSR* statement, and the second line defines the operation to be performed. Both are well documented and explained in the user's instructions.

With these two added lines, it is possible to run *PROG1*, which will automatically pass variables and load *PROG2*, which can then call on *PROG3*, etc., all while you just sit back and drink your favorite beverage.

The same limitations that apply to CHAIN, mentioned above, also apply to LOAD in the auto mode. Namely, a shorter program cannot call for a load of a longer program.

There are two features within the program that I did not like. The first is that if you save a program to page 1 using some particular name, then later you save a program using the same name, *MDISK* will save both programs with the

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same name. When making a call to the program by its name, *MDISK* will always use the first one saved. The second one is not accessible. The only way around this is to *KILL* the first program before saving a second with the same name. (If you modified *PROG1* and then tried to resave it as *PROG1*, you would now have two versions named *PROG1* and the second, corrected version would not be accessible.)

The second feature I didn't like was in the auto mode. If some type of error is made while in *MDISK*, it prints an error message on the screen. In the manual mode, this error message stays on the screen and you can see what went wrong. In the auto mode, the error message flashes by so fast, it is not possible to tell what it is. It would have been an improvement if some time delay occurred here to give the user a chance to see the error message.

The instructions said that it is possible to save *DATA* to page 1, but they gave no examples of how this is done. I could not figure a way to do it.

Would I buy *MDISK*? If I didn't have disk drives, yes. Many of my operations call for the back and forth use of two or more programs. To do this from cassette was time consuming and, at times, frustrating. *MDISK* saved me this frustration. Having disk drives, the time factor and frustrations are greatly reduced, but the CHAIN feature sure is a tempting one.

With the exceptions of the limitations above, *MDISK* is one of the better utilities I have seen for the 64K CoCo.

**(Skyline Software, 4510 W. Irving Park Rd., Chicago, IL 60641, tape $27.95, disk $29.95)**

**— Al Burzynski**

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# *DSKMON:* A Diversified Disk Utility

*DSKMON*, or DiSK MONitor, is a multipurpose disk utility designed specifically to serve three main functions of the serious Color Computer disk system user: It is the practical purpose of learning how the Color Computer uses its disk system; it allows the display and modification of data from the disk; and it allows file manipulation to the point of getting file information and selectively backing up files from one drive to another.

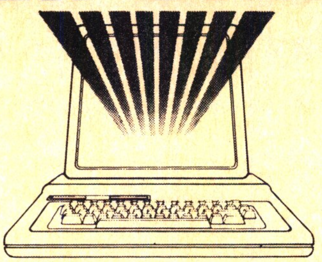
Let me explain the functions in detail. The learning aspects of the program are the same as with any disk monitor that will read in data and display it. One can investigate how data is stored on disk by examining the data off the disk using the monitor to read in sectors and displaying the information in various formats on the screen.

*DSKMON* requires two separate commands to perform this. The first command is "R" for Read Sector. After "R" is entered, the program will prompt for the drive, track and sector that you wish to read in (all inputs here are given in decimal). Then the "D" command is used to Dump the Buffer to the screen that now contains the sector specified by the "R" command. The screen is set up giving eight bytes to a line in Hex dump format followed by the ASCII equivalents on the same line. The information can then be scrolled on the screen by use of the up and down arrow keys. If any data needs to be modified (changed), then [BREAK] is hit to return to the main menu and the "M" command is chosen for Modify Buffer. A different type of screen is displayed using a "window" which singles out the byte that can be modified by typing in a two-digit Hex value to change it. This screen takes some getting used to and frankly, I've seen better. A screen where overtype is used would have been better (users of *VIP Disk Zap* or even *C-Bug* know what I mean).

One of the major learning aspects of this program lies, not in the operation of the program, but in the study of the source code. Yes, source code. This is one of the few programs I have seen that comes complete with the source code. The information here does not teach one directly how information is stored on the disk, or how to manipulate data to and from the disk, but allows one to study the actual program itself and learn how to perform disk I/O in machine language. It's worth the price of admission! I would like to see more companies take an interest in the machine language programmer and learner, and offer source code with their programs. Of course, I realize that this could lead to copyright problems with new and budding programmers taking source code from these programs and manipulating it as their own code. But I am glad to see it and plan to study the code in more detail in order to help me in my own program writing.

Another area *DSKMON* deals with is File Information. This command gives you a complete record of information pertaining to the storage of a file on disk. The display tells you what kind of file it is as well as the format of storage, granule usage, ML start, end, exec addresses, or disk space usage for other files. A Granule Conversion command is

# SUPER SCREEN



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- **PRINT @ is completely functional on the big screen.**
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### PRINT @ IS FULLY IMPLEMENTED

The PRINT @ statement is a valuable asset to the programmer when formatting text on the screen. The standard Color Computer will report an error if you specify a location higher than 511 but Super Screen allows locations all the way to 1223! You get a big screen and a powerful formatting tool as well. Of course, Super Screen also supports the CLS command allowing you to clear the big screen using standard Basic syntax.

### ON ERROR GOTO

That's right! Super Screen gives you a full implementation of ON ERROR GOTO including the ERR and ERL functions. Now you can trap errors and take corrective action to prevent crashed programs and lost data using the same standard syntax as other computers. The ON ERROR GOTO capability overcomes a serious deficiency of Color Computer Basic and greatly improves your capability to handle sophisticated tasks. All well written, 'user friendly' programs use error trapping techniques and yours can too! Now that's power!

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No more frustration as you edit a long line in your Basic program; just hold the space bar down and automatically step to the desired position in the line. Need a line of asterisks? Hold the key down and auto repeat will give them to you. Those of you who spend many hours at your keyboard will appreciate this outstanding addition to Super Screen's long list of impressive capabilities.

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Super Screen recognizes several special control code characters that allow selection of block or underline, solid or blinking cursor and other functions. You can 'Home Up' the cursor or you may erase from the cursor to the end of a line or to the end of the screen just like many other computers. These special codes give you an extra dimension of versatility and convenience that put Super Screen in a class by itself.

### AND MORE GOOD NEWS...

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc Basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it! Super Screen's low price will really please you; only $29.95 on cassette or $32.95 on disc!

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The Mark Data Products accounting system is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P&L or income report, an interim or trial balance and a balance sheet.

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All Orders: Please add $2.00 shipping and handling in the continental U.S. All others, add air shipping and $3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. Software authors—Contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software also included in the program to convert a granule number (given in Hex) into its appropriate track and sector numbers (given in decimal).

The last major function of *DSKMON* is to give Selective Backups of any files on a disk from drive 0 to drive 1. It allows by prompting and copying of any or all programs from one disk to another. This can be used only by two drive owners. As quoted in the instructions: "Apologies to those users with only one drive, but the continual switching of disks defeats the purpose of this command." Well, I still think it would be faster to type in a "Y" when asked to copy a program to another disk than to type the *COPY* command for each program.

*DSKMON* comes on a disk for 16K or 32K and there were no problems loading the program or the source code (*MACRO-80C* was used for the text). The instructions are clear and complete and the program is totally relocatable. And, or course, with the source code, one can do whatever they want to the program and then just reassemble it. One note, the instructions stated the program was called *DSKMON*, but the one on my disk was named *DMON1*.

**(Chroma Systems Group, P.O. Box 366, Dayton, OH 45420, disk $24.95)**

**— Eldon Doucet**

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***Software Review***

# Cards, Markers and Good Play Spell *CoCo Bingo*

For those of you who are from another planet, or have not been by a church or club hall on Tuesday nights . . . bingo is a game played on numbered cards. The cards have five columns with each column headed by a letter which, when put together, spells B-I-N-G-O.

Normally, the game is played by placing numbered balls in a cage, then shaking the cage and picking out a ball at random. Each time a ball is drawn, the number on the ball is called aloud. And if that number matches any number on your card, you mark it with a chip.

The object of the game is to get five chips in a row, either horizontally or vertically — "bingo."

The instructions included with *CoCo Bingo* give a more complete (all you ever wanted to know) explanation of the game of bingo.

The only difference between *CoCo Bingo* and regular bingo is the absence of the balls bouncing around in the cage. *CoCo Bingo* randomly selects the numbers for you and even comes with 25 bingo cards and a large supply of markers in a resealable pouch (a nice touch so all of the chips and cards don't get lost).

To use *CoCo Bingo*, just *CLOAD* and *RUN*. That's it! After *RUNning*, the title page is displayed and then you are given a choice as to the speed you wish the numbers to appear. Once you set the time interval, numbers will start appearing in a stationary ball on the screen. We think that the authors should have used a little more imagination and generated a more eye-catching display of balls being thrown around and popping up (picky, picky, picky). We tested the game with two children and two adults and found that when we used a caller and each player had two cards, five seconds was more than ample time to locate numbers on your cards. Without a caller, 10 or 15 seconds was more preferable since it gave you time to look at the screen, then at your cards.

If you think you have a bingo, yell "bingo" (or, as we Smiths say, "Schmidlap"). Then you or the person designated as the number-caller hits any key on the CoCo, which stops the balls from continuing. A display then appears which shows what numbers have been called during the game. The person who called bingo (Schmidlap) then checks his/her card to see if he/she actually has bingo. If the person did not have bingo, you have the option of continuing the game from where you left off.

If a bingo ends the current round and you choose not to continue, the CoCo will erase the program from memory and return you to BASIC.

This old favorite is great for parties and keeping groups of kids of any age busy on rainy days. The game is at its best when some form of prize is awarded for each bingo.

The program is written in easy-to-understand BASIC and you can really learn some good programming techniques.

Overall, *CoCo Bingo*, with cards and markers included, is well worth the price.

Hold on . . . I think I have a Schmidlap!

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**— Barry & Sandy Smith**

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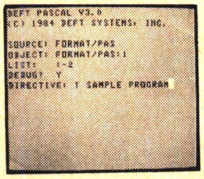

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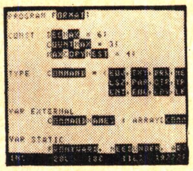

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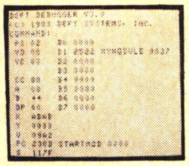

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# *4 Mile Island:* Good For The Beginning Adventurer

The "impossible" has happened! This area was devastated by a severe earthquake. The 4 Mile Island reactor has been severely damaged. The plant has been deserted. Only you can save the area from a major disaster! Your goal is to achieve a cold shutdown of the reactor at 4 Mile Island. Alternative? Death!

The new Adventure program *4 Mile Island* by Owls Nest Software is a good program for the beginning Adventurer, or even a seasoned Adventurer that wants to take a break from searching through thousands of rooms. This program is simple, yet challenging (I found 25 rooms to search).

You must traverse through the interior of the reactor in order to solve the method to achieve a cold shutdown. One of the good items about this program is that you do not have an unlimited amount of chances to solve the Adventure. If you take too many turns, the reactor overheats and has MELTDOWN, thereby ending the game. This is not a "real-time" Adventure, but the feature simulates "real-time," making the game more challening.

The Adventure comes on a tape for a 16K Extended BASIC Color Computer. It has an auto-load feature so the program starts up after loading. The program also disables the *LIST* feature in BASIC so that you cannot look for the answer after the game has been booted up. The program also will not work from a disk, but the auto-load feature does disable the disk so that you do not have to disconnect it.

In summary, *4 Mile Island* Adventure is an excellent Adventure for the beginner. I am sure that you will enjoy this Adventure just as much as I did.

**(Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, tape $17.95)**

**— Paul Lee**

---

*Hint . . .*

# Having RFI Problems?

If you are getting interference in the CoCo's video display on your TV, there may be a simple answer. If the set has a 75-ohm input connector (for cable TV), you can use a phono jack-to-F connector adapter (like Radio Shack 278-255) to plug the CoCo directly into the TV without using the switch box. Check your set's instruction manual for any special switches or jumpers that may have to be changed

**— Ed Ellers**

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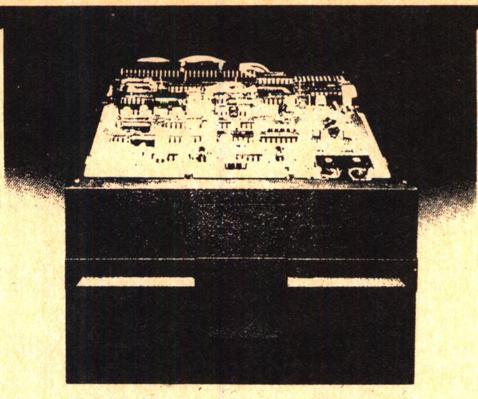

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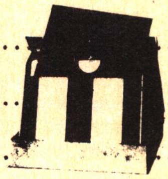

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# CoCo Community

We have compiled a list of Color Computer Clubs because of the many requests we have received. CoCo Clubs may wish to exchange newsletters, share ideas for topics of discussion at monthly meetings, etc.

Please let us know if we have omitted any clubs and send us complete up-to-date addresses. Only those clubs which have signed our "agreement form" will appear in this listing of CoCo Clubs. Also, please notify us if you wish to add or delete any names on this list. Send your information to:

CoCo Clubs
*the Rainbow*
9529 U.S. Highway 42
P.O. Box 209
Prospect, KY 40059

**ALABAMA**

Birmingham Alabama Color Computer Club, Robert Matthews, 1725 14th Ave. S., Birmingham 35205, (205) 933-0887

Huntsville Color-80 Users Group, Randy Niemann, 1011 Versailles Dr., S.E., Huntsville, 35803, (205) 882-2485

**ALASKA**

Alaska Color Computer Users' Group, Rick McDannel, 430C Beluga Ave., Ft. Richardson 99505, (907) 428-0392

**ARIZONA**

Tucson Color Computer Club, William H. Nunn, 6857 A Lighting Circle #22, Tucson, 85708

**ARKANSAS**

Central Arkansas CoCo Club, Melinda Braslovsky, 1203 Erving Rdg., LP Cabot, 72023, (501) 982-8854

**CALIFORNIA**

CoCo Nutz Computer Club, Walter V. Seay, 68-461 Highway 86, Thermal, 92274, (619) 397-4252

Citrus Color Computer Club, Joseph Kohn, P.O. Box 6991, San Bernadino, 92412 (714) 792-8721

Joe Bennett, 1169 Florida Street, Imperial Beach, 92023, (474-6213)

Local Color—A CoCo Club of San Francisco, Andrew G. Kieval, P.O. Box 421242, San Fransico 94142

Los Angeles CoCo Users Group, Mark Randall, 2227 Canyon Rd., Arcadia, 91006, (213) 355-6111

Los Angeles-Wilshire Color Computer Users' Group,c/o Norm Wolfe, 269 S. Lafayette Park Pl., Los Angeles, 90057

Sacramento Color Computer Club, Wayne Chrisope, P.O. Box 9, Elverta, 95626

San Joaquin CoCo Club, Steven Paul Moreno, P.O. Box 99024, Stockton, 95209, (209) 951-3938

Salinas Color Computer Club, Larry Livingston, 501 Monterey Highway, Salinas, 93908, (408) 484-9697

Silicon Valley Color Computer Club, Shawn Jipp, P.O. Box 61593, Sunnyvale, 94088, (408) 749-1947

South Bay Color Computer Club, Karen Schlotzhauer, 2545 W. 255th Place, Torrance, 90505, (213) 539-2439

Ventura County Color Computer Club (VC4), c/o Pete Lydall, Oxnard Public Library, 214 "C" Street,Oxnard, 93030, (805) 984-1842 or DATA (805) 984-1842

**COLORADO**

Lowry Microcomputer Club/CoCo Users' Group, Jerry D. Surritte, 2249 Moline St., Aurora, 80010, (303) 343-3273

**FLORIDA**

Broward CoCo Club, Sue Spahn, 11950 N.W. 29th FL 33582, (305) 741-4737

C.C. Club of Sarasota, Ernie Bontrager, 4047 Bee Ridge Rd., FL 33582, (813)921-7510

Jacksonville Color Computer Club, William H. Brown III, 2411 Hirsch Ave., Jacksonville, 32216 (904) 721-0282

Northwest Florida CoCo Nuts, William N. Lamb, Pres., P.O. Box 1032, Fort Walton FL 35249, (904) 244-5281

**ILLINOIS**

Cook County Color Computer Club, Tim Powers, 1633 Fifth Ave., Chicago Heights, 60411, (312) 747-7062

Glenside Color Computer Club, Chuck Roberg, 521 Canyon, Carol Stream, 60188, (312) 690-9374

Motorola Microcomputer Club, Steve Adler, Pres., 1301 Algonquin Rd., Schaumburg, 60196 , (312) 576-3044

Northern Illinois Color Computer Club, 580 Milton Lane, Hoffman Estates, 60194, (312) 885-2573

Town & Country CoCo, Kenwood, Chicago, (312) 493-3748

**INDIANA**

Southern Indiana Computer Club, Route 1, Box 459, Mitchell, 47446

Three Rivers Users Group, Russ Garner, 533 Villa Park Ct., Fort Wayne, 46808

**IOWA**

Iowa City TRS-80 Users Group, Susan Chapler, R.R. 6, The Woods, Iowa City, 52240, (319) 351-5959

Metro Area Color Computer Club, K.L. Knudtzon, 3324 11th Ave., Council Bluffe, 51501

**KANSAS**

Kansas City CoCo Club, Mike Allinder, P.O. Box 11192, Kansas City, 66111, (913) 287-1904

Topeka Color Computer Club, Kevin Cronister, 2224 Hope, Topeka, 66614 (913) 272-1353

**KENTUCKY**

Roger Idstrom, 2603 Garden Lake Lane, Louisvile, 40220, (502) 491-1853

Lo-CoCo Club Liason, 2820 Del Rio Place #27, Louisville, 40220, (502) 458-0649

LOCO-COCO, c/o Mike Standefer, 3141 Doreen Way, Louisville, (502) 458-6990

**LOUISIANA**

Red Stick Color Computer Club, Gary Cash, Pres., 8929 Metairie Drive, Baton Rouge, 70810, (504) 293-7799

**MASSACHUSETTS**

Greater Boston Super Color Users Group, Robert Biamonte, 6 Boulder Drive, Burlington, MA 01803

New England C.C. Users Group, Christopher E. Sweet, P.O. Box 255, Harvard, 01451, (617) 456-8291

Massachusetts CoCo Club, Jason Rahaim, Spring St., Lunenberg, 01462, (617) 582-6514

**MICHIGAN**

Greg Miller, P.O. Box 365, Haslett

Midland C.C. Club, Neil Drake, 709 Coolidge, Midland, 48640, (517) 631-2939

Michiana CoCo Club, Clay Howe, 310 S. Jefferson St., Sturgis, 49091, (616) 651-4248

Petoskey Area CoCo Club (PAC$^3$), Dennis Hoshield, 670 Liegl Drive, Alanson, 49706, (616) 347-0607

**MISSISSIPPI**

Singing River C.C. Club, Henry Nielsen, 9001 Gray Ave., Ocean Spring, 39564

**MISSOURI**

Mid-America Color Computer User's Group, Jerry Morgon, 807 Ponca Drive, Independence 64056, (816) 796-5813

North County 80 Group, Tom Vogel, 12 Ville Donna Ct., Hazelwood, 63042, (314) 739-4078

**MONTANA**

Billings C.C. Club, Jayne Kenyon, 4306 Phillip Billings, 59101

**NEW JERSEY**

Bug 80 Users' Group, George R. Miller, Jr., Box 62, Glen Gardner, 08826

Loco CoCo Club, Bud Lavin, 73B Wavercrest Ave., Winfield Park, 07036

**NEW MEXICO**

Chaves County Color Computer Club, Lee Mitchell, 1102 Melrose Drive, Roswell, 88201, (505) 623-0789

**NEW YORK**

Adirondack CoCo Club, Bill Edwards, Box 365, Bolton Landing, 12814, (518) 644-9927

Broome CoCo Club, Bucky Helmer, 57 Front St., Binghampton, 13905

C.C. Club of Central N.Y., Joseph Short, 248 S. Fourth Ave., Ilion, 11357, (315) 895-7730

Kings Byte CoCo Club, Morty Libowitz, 1063 East 84th St., Brooklyn, 11236, (212) 763-4233

Queensboro Color Computer Club, Bob Rosen, Springfield Blvd & 56th Ave., Bayside, 11364, (212) 631-6233

**NORTH CAROLINA**

TRS-80 Users' Group of Charlotte, Bill Hardin, 6613 Summerlin Pl., Charlotte, 28226, (704) 542-9959

Raleigh Color Computer Club, David Roper, P.O. Box 681, Garner, 27529

**OHIO**

CoCo Club of Youngstown, Timothy McFadden, P.O. Box 478, Canfield, 44406, (216) 788-4218

Columbus & Central Ohio Color Computer Club, D.E. Sparrow, 19 E.N. Broadway, Columbus, 43214, (614) 268-5366

Cincinnati TRS-80 Users Group, R.A. White, 44 Dow Court, Fairfield, 45014

Dayton Area Color Computer Users Group, David R. Barr, 2278 Yorkshire Pl., Kettering, 45419, (513) 293-2228

Dayton CoCo Users' Group, Joseph P. Evans, 609 Applehill Dr., W. Carrollton, 45449

Miami Valley CoCo Club, R. Douglas Wales, Pres., 2065 Le Feure Rd., Troy, 45373

M.U.G. of CoCo—Middletown Users Group, James Carr, Middletown, 45042, (513) 424-6905

Northeastern Ohio (N.E.O.) CoCo Club, Tony Rugue, 527 Malvern Drive, Painsville, 44077, (216) 354-2736

The Cleveland CoConuts, Paul Selig, 20734, Stanford Ave., Fairview Park, 44126, 333-2920

**OREGON**

Willamette Valley CoCo Users, Brian James, P.O. Box 11468, Eugene, 97440, (503) 687-9286

**PENNSYLVANIA**

Penn-Jersey Color Computer Club, Jerry Behler, 1231 Walnut St., Allentown, 18102, (215) 253-1238

Pittsburgh Color Group, William Tucker, P.O. Box 351, West Mifflin, 15122, (412) 466-3078

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New England CoCo Nuts P.O. Box 6604, Providence, 02940

**SOUTH CAROLINA**

Hilton Head Island CoCo Club, Kevin Clark, P.O. Box 6187, Hilton Head Island, 29928, (803) 785-9630

Metropolitan Greenville CoCo Club, Ed Lowe, P.O. Box 6, Gray Court, 29645, (803) 876-3928

Midlands 80 Computer Club, Robert Rose, P.O. Box 7594, Columbia, 29202, (803) 776-4361

Spartanburg County CoCo Club, Dennis Shattuck, 473 Royal Oak Drive, Spartanburg, 29302, (803) 583-3017

**TENNESSEE**

Chattanooga CoCo Club, Jim Perkins/Jim Cox, P.O. Box 9825, Chattanooga, 37412, (615) 870-2439

Memphis Color Computer Users' Group, Ben Barton, Pres., 4903 Warrington Rd., Memphis, 38118, (901) 795-7075 or 362-5945

**TEXAS**

CoCo User Group, David Karam, 1809 Dexter, Austin, 78704, (512) 442-6317

International Color Computer Club, Inc., Ronald L. Garrett, Pres., 2101 East Main Street, Henderson, 75652, (214) 657-7834

**UTAH**

Ogden CoCo, Kathy Rush, 4535 S. 2600 W. Roy, Ogden, 84067

**VIRGINIA**

Central Virginia Color Computer Club, Lane Lester, 413 Woodland Circle, Lynchburg, 24502, (804) 237-4188

D.C./N. Va. C.C. Club, Jack Darling, 43 Donovan Dr., Alexandria, 22306, (703) 780-6159

**WASHINGTON**

Northwest Computer Club, Judy Gehman, E. 14012 Cataldo, Spokane, 99216, (509) 928-2169

**WEST VIRGINIA**

Kanawha Valley Personal Computer Club, Robert L. Vaughn, 1223 Ridge Drive, S. Charleston, 25309, B.B.S. (304) 925-3338 or B.B.S. (304) 345-8280

Mtn. State CoCo Users Group, Donald G. Barber, Jr., P.O. Box 1084, Morgantown 26507, (304) 599-4493

Mil-O-Bar C.C. Club, Jim Lemaster, Ona, 25545, (304) 743-4752

Blennerhassett CoCo Club, David Greathouse, Rt. 9, Box 119, Parkersburg, 26101

**WISCONSIN**

Southern Wisconsin CoCo Club, David C. Buehn, P.O. Box 411, Twin Lakes, 53181

**CANADA**

**ALBERTA**

Calgary Color Computer Club, David Logan, 151 Whitelock Place N.E., Calgary, T1Y 4S7

Medley Computer and Electronics Club, P.O. Box 1267, Medley, T4A 2M0

**NEW BRUNSWICK**

Color Computer Moncton Users Group (CoCo MUG), Leo Allain, 91 Woodland Drive, Moncton, E1E 3C4

**NEWFOUNDLAND**

Avalon CoCo Club, Mr. A.R. Thompson, Chairman, 10 Foran St., St. John's, A1E4G1

**NOVA SCOTIA**

Halifax Dartmouth CoCo Users Group, P.O. Box 572, Dartmouth, B2Y 3Y9, (902) 469-3656

**ONTARIO**

K-W C.C. Club, Peter Karwowski, 23 Hudson Cr., Kitchener, N2B 2V7

International Adventurer's Club, Maurice Dow, 84 Camberley Cres., Brampton, L6V 344

Meadowvale Color Computer Club, Howard Porter, P.O. Box 186, Streetsville, Mississauga, L5M 2B8

Niagara Regional CoCo Club, Harry VanDyke, 7707 Jubilee Drive, Niagra Falls, L2G 7J3

London CoCo Nuts Computer Club, Harry K. Boyce, 180 Concord Road, London, N6G 3H8 (519) 472-7706

**QUEBEC**

Montreal TRS-80 Users Group, Jacobus P.C. Bagchus, Pres., 1176 Phillips Place, Suite 201, Montreal, H3B 3C8, (514) 861-3488

South Shore CoCo Club, Jacques Bedard, 33 Lisilre, St-Constant, P.Q. J0L 1X0

**SASKATCHEWAN**

Regina Color Computer Club, Georges Glass, 26 Tweedsmuir Bay, Regina, S4X 2B1, (306) 949-3942

Saskatoon Color Computer Club, Guy Tomashewski, 415-423 Pendygrasse Rd., Saskatoon, S7M 4Z2

**MEXICO**

Mexico City Color Computer Club, Marcelo Luft, Laja #232, 01900 Mexico D.F., Mexico City, 5-68-78-75

**WEST GERMANY**

First CoCo Club Hamberg, Theis Klauberg, OP DESOLT 56, 2000 Hamburg 65,

## new clubs

*Editor:*

If there are any people in the Glenwood/Alexandria area interested in starting a Color Computer Club, please call me at (612) 278-3580 or write me at Rt. 1 Box T-7, 56383.

*The Rainbow* is an excellent magazine. Keep up the good work.

*Rogers George IV*
*Terrace, MN*

Are you interested in forming a Color Computer/OS-9 Users group in the Ames area? Please give me a call or write me. Maybe we can all get something organized. Contact me at 651 Pammel Court, 50010; phone (515) 292-2712.

*Tim Harris*
*Ames, IA*

We are currently forming a users group in the Jefferson City-Central Missouri area. Anyone interested in participating may contact me at 900 Rock Hill Road, 65101 or call (314) 893-2789.

*Wayne E. Johnson*
*Jefferson City, MO*

I am looking for CoCo users in the Bergen County area. My address is 553 Huckleberry Lane, 07417.

*Joel Makowsky*
*Franklin Lakes, NJ*

I would like to announce a Color Computer Club for kids (teens). I am in the Grand Island area of western New York. For more information please contact me at 1897 Bedell Road, or phone 773-5371.

*Ricky Susfalk*
*Grand Island, NY*

The Adirondack C.C. Club publishes a newsletter every three months. The cost is $4 a year. Please write for a sample newsletter and entrance form. Club membership is still free. Box 365, 12814.

*Bill Edwards*
*Bolton Landing, NY*

The Northern Illinois Color Computer Club (NICCC) meets every fourth Tuesday at the Des Plaines Public Library.

For more information contact me at 580 Milton Lane, 60194, (312) 885-2573.

*Richard Ekstrom*
*Hoffman Estates, IL*

We would like to announce the existence of the Niagara Regional CoCo Club, regrouping Color Computer users of the Niagara Peninsula in Ontario, Canada. We meet every second Sunday of each month in the cafeteria of Confederation High School (670 Tanguay Ave., Welland) between 1 and 4 p.m. We are about 80 members hoping to meet other Color Computerists. Anyone interested should contact Gerry Chamberland at (416) 357-3462 or Gilles Prescott at (416) 734-3529 or write us at 7707 Jubilee Dr., Niagara Falls, L2G 7J3.

*Gilles Prescott*
*Niagara Peninsula, Ontario*

I would like to inform your readers of the formation of a CoCo Club on the South Shore of Montreal. We meet on the second and fourth Sundays of each month at 1 p.m. Our principle aim is mutual assistance and to this end some of our members even translate into French existing programs for members' ease of use and benefit. For further information contact Jacques Bedard, 33

Lisiere, St—Constant, P.Q. J0L 1X0, telephone number (514) 632-4311.

*L. D. Villeneuve*
*Greenfield Park, P.Q.*

We are pleased to announce the formation of our user group — Color Computer Moncton Users Group (CoCoMUG) in Canada. We would like to hear from as many users groups as possible and welcome any assistance offered us. Contact us at CoCoMUG, 91 Woodland Dr., E1E 3C4.

*Leo Allain, Pres.*
*Moncton, N.B.*

We have a small local users group in the Walnut Creek-Concord area called the "Contra Costa County Color Computer Conspiracy" . . . the COSIXers. Interested people can contact me for additional information at 1754 Kasba Court, 94518, 825-9939.

*T. J. Morris*
*Concord, CA*

We would like to inform readers that a TRS-80/TDP 100 Color Computer Club is now being formed in Salinas, Calif. We need more members very much. For further information contact me at (408) 422-9475.

*Larry Livingston*
*Salinas, CA*

I would like to announce the formation of a Color Computer Club in the Pinellas/Hillsborough county area of Florida. The Color Force is the group's name. We also run a public bulletin board, Colorama of Dunedin Realty. If you have any questions or would like to join The Color Force, call Reid Baker (vice president) at (813) 733-5095. Or, call the BBS at (813) 733-2415. We prefer that you call voice or write: The Color Force, c/o Dunedin Realty, 503 South Paula Drive, 33528.

*Emery Mandel*
*Dunedin, FL*

We've started a CoCo Club called the Alachua CoCo Club and our first meeting drew about 30 people with very little advance advertisement. For more information contact us: George McDonald (904) 462-5392, or Albert Kirk (904) 377-6285. We meet at 555 SE 5th Ave., 32601 on the second Tuesday of every month at 7 p.m.

*Sal Capozzi*
*Gainesville, FL*

I am happy to announce the official beginning of the Evansville CoCo Club. Anyone interested please call or write Box 462, 47633, (812) 874-2210.

*Brian Broyles*
*Poseyville, IN*

Please publish the existence of the Greater Boston Super Color Users Group. We meet every second Thursday of the month at Sylvania Technical School, 63 Second Ave., Waltham, Mass. We publish a monthly newsletter, the SCUGBUG. CoCo users may contact John DeBay, 100 Central Street, Waltham, Mass., 02154, for more information.

*Robert Biamonte*
*Burlington, MA*

I am starting a club in northern Michigan. There will be monthly newsletters and meetings; and there will hopefully be help and information for everyone. If interested please call or write, Your Computer Services, 670 Liegl Dr., 49706, (616) 347-0607.

*Dennis Hoshield*
*Alanson, MI*

I would like to announce the first New York Metropolitan Area Color Computer Club, centrally located (near the Long Island Expressway) for CoCo owners residing in Long Island, Queens and Brooklyn. The Queensboro Color Computer Club meets in Room T18 of the Technology Building of Queensboro Community College. As an added attraction, the room is fully equipped with 18 full blown 64K Disk systems with monitors and printers. Meetings are the first Saturday of every month at 10 a.m. Meeting notices are posted on the Rainbow Connection BBS.

*Bob Rosen*
*Woodhaven, NY*

I wish to announce the reorganization of the Albuquerque Color Computer Club, a part of the New Mexico Computer Society. We meet every other Tuesday at 7 p.m.; meetings last two to three hours. There are no dues unless you join the computer society itself, which we prefer that long-time members do eventually. For more information contact Steve Maggs at 293-8567 or Anthony Segura at 821-5876.

*Stephen Schenkel*
*Albuquerque, NM*

I would like to inform your readers of the formation of the Piedmont Color Computer Users Group here in Lincolnton, N.C.

We have been meeting since August and now have 35 members. Meetings are held the second Sunday of each month at 2 p.m. at the local Commodore dealer's store, so inquiries should be sent to us at the following address: Piedmont Color Computer Users Group, c/o Computers & Programming, 111 S. Academy St., 28092.

*Ernest Withers*
*Lincolnton, NC*

Is anyone interested in putting a CoCo Club together here in Victoria, B.C.? Please write me at 973 Weaner Pl., V9C 3C2.

*Darla Ellis*
*Victoria, British Columbia*

I'm trying to form a users group in the Athabasca area. This is for both CoCo and Apples. Anyone interested should contact me at 675-9295 or write Box 1594, T0G 0B0.

*Dooley Nelson*
*Athabasca, Alberta*

I would like to join a CoCo Club in my area; Ottawa-Hull (Canada). My address is 14 Avenue D'Auvergne, J8T 1H1.

*Mireille Poulin*
*Touraine, Quebec*

I'd like to start a users group in the Stockton-San Joaquin Valley. Anyone interested call me at (209) 951-3938 or write: S.P.M., P.O. Box 99024, 95209.

Also, keep up the good work at *the Rainbow*. It's a wealth of information for such a low price!

*Steven Paul Moreno*
*Stockton, CA*

A new Color Computer Club in the northern Virginia area meets monthly in the community room of the Manassas Public Library, Manassas, Va.

The club is for all Color Computer users, from beginners to advanced. Regular classes in assembly language and BASIC are in progress, and several members are informally meeting as an OS-9 SIG.

Anyone wishing more information about upcoming meeting dates, times and special programs should contact the vice president, Allan Weinstein, (703) 361-2293 (in the Manassas area) or me (703) 820-0658 (in the greater Washington, D.C. dialing area).

*Logan McMinn*
*Falls Church, VA*

I would like to tell your readers about our computer club, the "Triad Coconuts." We have about 20 members from the greater triad area and we have room for all those new CoCo owners. For more information call or write to: 4984 Woodsboro Lane, 27105, (804) 767-6700.

*Terry May*
*Winston Salem, NC*

On behalf of the other members of the Erie TRS-80 User's Group, I would like to inform your readership of the recent formation of our computer club. We have monthly meetings, a club newsletter, a software library of public domain programs and a wide variety of other interests. Although the vast majority of our membership are CoCo owners, we are open to all TRS-80 users.

Anyone interested in our User's Group may write or call our club president: 320 Maryland Ave., 16505, (814) 456-4786.

*Tom Kuklinski*
*Erie, PA*

Please list in your magazine the existence of CAPATUG (Capital Area TRS-80 Users Group). Our meetings are held the first Thursday of each month at the Fairview Township Fire House in New Cumberland, Penn. All are invited to attend and participate. For more information call the CAPATUG Bulletin Board at (717) 774-6543 or write to CAPATUG, 340 Lewisberry Rd., 17070.

*David Morrow*
*New Cumberland, PA*

The Kanawha Valley Personal Computer Club welcomes computer users having all types of equipment. Meetings are on the second and fourth Tuesday of each month at the Seventh Day Adventist Church, 622 Kanawha Boulevard, West, starting at 7 p.m. The first Tuesday features user group activities and the second Tuesday has tutorial sessions. CoCo users are the majority of the nearly 100 members.

*Sharon J. Graff*
*S. Charleston, WV*

We are a non-profit organization called the North Island CoCo Club. Our mailing address is P.O. Box 1740, V0N 2P0. We are a TRS-80 club. We have a software, reading, and hardware library. If anyone is interested please write or phone (604) 949-6761.

*Ann Marie MacKay*
*Port Hardy, B.C.*

I would like to inform your readers of the London CoCoNuts Computer Club. The meetings are held at 7 p.m. at Fanshawe College. The club meets the last Monday of each month. For further information contact (519) 471-1345, 180 Concord Road, N6G 3H8.

*Harry Boyce*
*London, Ontario*

A few of us from Down Under would love to correspond with the CoCo Users of America. We have Color Computers over here, not Dragons as some have thought, and are eager to bridge a gap that has developed between our countries. We wouldn't mind some hints on club development, either. Contact could be made by sending correspondence to: P.O. Box 506, 2760.

*CoCo Colyteens*
*St. Mary's, N.S.W., Australia*

We are announcing a CoCo Club called Blacktown City Color Computer Users Group. For correspondence contact me at 27 Alford St., Blacktown, N.S.W., 2148, (02) 626-9936.

*Keith Gallagher*
*Blacktown City, Australia*

I am very interested in corresponding with an American CoCo Club, because in Germany there are not very many CoCo users. If you are interested, write to me (by airmail): First CoCo Club Hamburg, OP Desolt 56, 2000 Hamburg 62.

*Theis Klauberg*
*Bültenmoor 43, West Germany*

I would like to hear from anyone in this area interested in forming a CoCo User's Group. Please call me at 795-6211 or write to me at 320 Old Silo Road, 06477.

*James J. Pino*
*Orange, CT*

## PRINT #-2,

*(continued from Page 14)*

even if the only alternative is to have to lose?

I would welcome any input you might have on this issue as a letter to the editor. I think we might see some interesting and thought-provoking positions on the subject.

We are in the process of planning what has become one of the more interesting projects of our year — our annual Anniversary issue. This is the July issue and it will be *the Rainbow's* third birthday this time around. As usual, we have planned a surprise. And, as is usual with surprises, we aren't going to tell you what it is.

But, we think you'll like what we have planned and, even if not, you will certainly agree that it will be unique.

By way of finally for this month, I have some good news for those of you who have been harried trying to call us on the telephone. After watching our "line busy" lights burn on all lines more often than not, I finally broke down and ordered more lines for *the Rainbow*.

It should make things easier for you to reach us and, if there is anything that we can do to help, I hope you will. The number remains unchanged: (502) 228-4492.

**— Lonnie Falk**

**See Page 145**

**- a lot of software for a little silver**

*(continued from Page 29)*

It was asked of Mr. Rosen how he had all *Rainbow* programs on his bulletin board available for downloading, and he replied that his was the official *Rainbow* bulletin board, and these programs were there by arrangement with *Rainbow*.

> *"The seminar did a good job of providing a look at the immense scope of the theft problem, and gave a lot of people a chance to get a lot of gripes off their chest."*

A much questioned subject was the practice of putting protection on a tape or disk at all, and whether or not there was evidence either way to indicate if this was an effective strategy to limit piracy. Searby said that Computerware had a policy of not protecting their utilities and applications, but felt that the protection of games was necessary. He admitted that no hard facts were available either way.

Goodman took a position in support of education of the consumer as the best way to combat piracy, and a member of the audience said he thought that protection or no protection should be a part of the advertised description of the product, so the user would know ahead of time what he was getting.

Along that line, a question was raised about the practice of some software vendors who put a contract in the software package. This contract must be signed by the customer and returned before support can be obtained from the vendor. He pointed out one case of a very expensive program, *Piratector*, which would not work normally until the contract had been signed and returned, at which time the company would provide a "patch" to correct the abnormal operation. The customer pointed out that he didn't know about this additional contract requirement until the vendor already had his money, and he felt that the buyer has a right to be put on notice by the vendor in a situation like this. Searby agreed, and said that his company tried to make mention of things like this in their catalog, but that space often did not permit it in magazine advertising.

In general, the seminar did a good job of providing a look at the immense scope of the theft problem, and gave a lot of people a chance to get a lot of gripes off their chest. It did not provide much in the way of ideas for solutions, however, and I think that may well be because nobody has any real solution. It was pointed out that the biggest problem isn't the professional thief, it's the private individual multiplied by all the other individuals all over the world who don't see the clear fact that software piracy is stealing, even if you call it by nice names like trading. It is this rationalization that is at the core of the trouble.

Our thanks to the people on the panel for putting themselves on the firing line in what shapes up to be one of the tough issues of the next few years in this industry.

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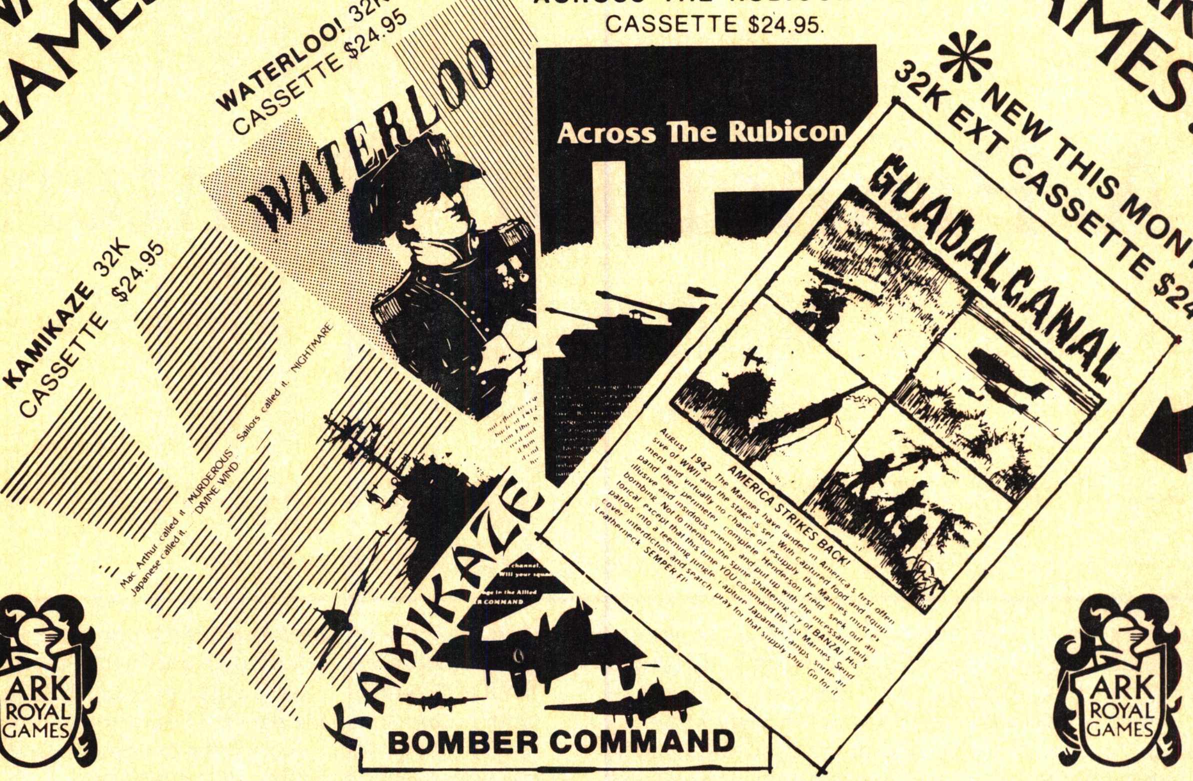
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# A Primer On Printers

By Tom Nelson
*Rainbow* Contributing Editor

I'm taking some time off the legal beat for a bit to write a little something for those of you who are considering buying your first printer, or who have just purchased a printer. Those of you who own a printer already know it, and those of you who don't own a printer yet I'll tell: Printer manuals are a poor lot. They are written for the person with a Ph.D. in computer science who has the time and inclination to study a new computer language. Almost none of the manuals contain sufficient information even for the Ph.D. to use the printer! With such manuals it's a miracle that the rest of us can make our printers work at all.

With this and a subsequent article I hope to dispell some of the mystery about what the world of printers is like and how you can make your CoCo and your printer work together. Let's start with a discussion about printers.

Printers can be divided up in two ways. One way is to distinguish between dot matrix printers and letter quality printers; the other way is to divide the world of printers up into "dumb" printers versus "smart" printers. The first way distinguishes the end product produced by the printer; the second way distinguishes how the end product is produced.

Letter quality printers are "impact" printers, where a complete character is struck against the paper, making a high-quality, attractive typeface. Dot matrix printers, on the other hand, print characters by composing each character out of several dots. The printer is programmed to strike several pins to make each character. The final product from a dot matrix printer ranges from very poor quality to very high, nearly letter quality. As time goes on, the quality of dot matrix printers is steadily increasing.

---

*(Tom Nelson was formerly a special assistant attorney general for the State of Minnesota. He currently is general counsel for Softlaw Corporation, makers of the* VIP Library™ *and of* ColorQuest™ *games.)*

Just to be complete, you should know that another type of printer is now on the horizon:the ink jet printer. This type of printer produces letter quality printing with a jet of ink rather than by striking paper. These printers should produce a very nice product and will be extremely desirable—once the price comes down out of the heavens!

Printers can also be divided up into dumb and smart printers. Smart printers are printers with the built-in abilities to do any number of tasks in addition to simply printing characters of text. The more the printer can do the smarter it is. If it can't do anything, or if it can only do a few things it is called a dumb printer. The dot matrix character generation method used by dot matrix printers has made them very versatile for creating many different print fonts and styles, such as elongated text or compressed text, italics and so on. Thus, dot matrix printers have increasingly been made very smart to do all these things. This is not to say that letter quality printers are not smart. Although they do not have the versatility allowed by the dot matrix method, they do allow you to change the daisy wheel or thimble for any of a score or more different type faces. Anyway, there are other things that make a printer smart, such as automatic underlining, superscripts, backspacing, proportional spacing, and total paper movement control. Smart printers of both kind give the user virtually total control over such items.

When you go looking for a printer you want to find one in your price range that gives the quality of print you need and has the built-in features you constantly use. Of course, the more you can pay the more you will get. Still, even in a single price range there is a great difference in features offered. There are some very dumb printers selling for the same price as quite smart printers of equal or better quality of print.

In the lower price range you are likely to look at printers which do not offer lowercase characters, or do not offer descending lowercase characters, that is, the lowercase "p," "y," "j" and "q" do not descend below the line, but are scrunched to fit on the line. With lower priced printers also be sure to check if they have the ability to underline, backspace or do superscripts or subscripts—at all. Many do not, much to the dismay of the purchaser.

### Matching Your Software With Your Printer

Once you have your printer, the next task is understanding how to make your software run your printer. Very few programs can fully use every feature offered by every printer. For the most part this is because of the design of the word processor or other program. Often it is a limitation imposed by the need for totally versatile software. Some features are printer specific, for example, using graphics. This means that with some features, each printer uses its own method to perform those features. The program would have to be tailored to each printer in order to allow each printer to perform that feature. With the hundreds of different types of printers out there this is a hopeless task. Most programs therefore elect either to work with a specific printer, or to provide the means for the user to customize the program so that it can use that feature. Some features are so troublesome that general programs do not support them at all and a special program must be purchased to do the task.

Even though software cannot be expected to use every feature of your printer, you still want software that can use every feature of your printer feasible. What follows is a discussion to help you better understand how your printer is controlled.

### The Structure of Information

The basis for understanding how printers work is knowledge of the ASCII system. ASCII is a standard for symbols used in computer communications, the acronym standing for American Standard Code for Information Interchange. It provides the building blocks for almost all communications. To understand it better you first must understand a little about how computers store and use information.

The most basic thing which is necessary for communication between different computers and printer is a standard system for representing data. The printer must know what the computer means in computerese.

> *"All computers think and talk with numbers; people, however, communicate with symbols. The designers of computers have devised a means for our symbols to be uniformly used by computers so that computers can communicate."*

Computers "think" with electricity, and this limits them to two states: off and on. All data in the computer is stored as binary digits ("bits") which are off or on. This feature makes binary arithmetic the basis for manipulating data in computers. Eight bit computers deal with data in eight-bit chunks called "bytes." The sequence of eight bits per byte allows up to 256 numeric combinations of ones and zeros per byte; 256 has thus become a standard number of things allowed by computers.

These 256 combinations must be used for storing and

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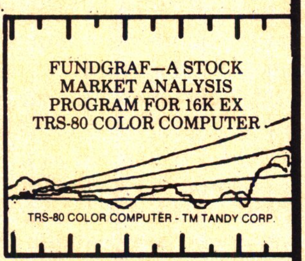
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handling all commands, instructions and data in your computer. Obviously, there are more than 256 different commands, instructions and forms of data. The computer uses different hardware and software to handle different tasks in 256 unit chunks.

One of the most important of these chunks is used to define how data is represented, i.e., the letters of the alphabet, punctuation, numbers and graphic characters, and 256 separate types of data are allowed. Each unit of data is assigned a number so that the computer can deal with it as a discrete unit.

Other 256 unit chunks are used for machine language instructions, tokenized BASIC commands, locations and the like. The interpretation of the exact correlation of each number in the computer, from 1 to 256, depends on the hardware and software using the number.

The chunk to which we will devote most attention will be those 256 units which are assigned to the data symbols. It is a proper understanding of these symbols which is most crucial to useful data communications.

**The ASCII System**

All computers think and talk with numbers; people, however, communicate with symbols. The designers of computers have devised a means for our symbols to be uniformly used by computers so that computers can communicate. As noted above, this system has the acronym ASCII, standing for American Standard Code for Information Interchange.

The ASCII system is a very limited standard. Of the 256 possible symbols which could be used for representing data, the ASCII standard covers only the first 128. You can find ASCII charts just about everywhere, including in printer manuals, your BASIC manuals, VIP library manuals, and so on. The ASCII chart contains a list of symbols with corresponding numbers (numeric equivalents) from 0 to 128, and sometimes even more information. The numeric equivalents for the ASCII symbols have been randomly assigned by the people who created the standard.

Of the standard 128 ASCII symbols the first 32 symbols are called control codes; the remaining 96 symbols are the letters of the alphabet, in upper- and lowercase, numbers, punctuation and other standard keyboard symbols. Let's discuss each of these.

First the 96 ASCII symbols, represented by the decimal numbers from 32 to 127. These symbols, from the space character (32) to the rubout character (127) are standard with every system adhering to ASCII, which is nearly every type of computer and printer made. These symbols comprise the alphabet, numbers, etc. No matter the computer, the same symbol will always be assigned the same number. A space will always be 32, "A" will always be 65, and so on. This standardization allows free transfer of data between computers or between computer and printer since each device will interpret the numbers to be the same characters.

The control characters are different. Control characters, covering numbers 0 through 31, are symbols used to control display and communication functions in computers and print functions in printers. Control characters cover such things as the "bell" character to sound a beep, the formfeed character, linefeeds, and escape. Although they have been assigned standard names, they do not always have the same function in all computers or printers. Thus, control characters must be used carefully.

What of the remaining 128 symbols from 128 to 255? These symbols are not standardized yet, although there is great likelihood that they will be in the near future. Now, each computer, printer or other device uses these symbols for different things. Your computer uses them for screen representation of its graphics symbols which you probably use in your programs. Your printer may use them for a special character set, such as copyright and other legal symbols or the Japanese alphabet. Because of this lack of standardization, it is very certain that what will be shown on the screen when you generate decimal 128 to 255 and what will be printed when you send your file to the printer will be different. You must, therefore, be sure to refer to your printer manual to see what you will be printing when you generate one of these numeric equivalents.

**From Keyboard to Memory**

The ASCII system is used by most word processors and other editors to handle all your text. This is essential so that you can use other ASCII compatible programs to manipulate your files, such as a spelling checker or a terminal program. Without a standard system, you couldn't even spell check a letter.

> *"If you have your buffer chock full of text you want to have printed, your buffer will contain oodles of bytes, each containing a number from decimal 0 to 255 representing an individual ASCII symbol."*

So, what exactly happens when you type in letters? When you press a key on the keyboard, what you are really doing is putting a number into the buffer, that number being the numeric equivalent of the ASCII symbol you have generated—the number you see next to the symbol on the ASCII chart. The keyboard is an ASCII device and so is the screen generator. Each is ASCII compatible so that each reacts the same way to numeric equivalents of ASCII symbols. Manufacturers wishing to be compatible with ASCII make sure that the numbers used in their systems always result in the same ASCII symbols.

I'll show you what I mean. When you press the "7" key, you have generated the ASCII symbol 7, which is represented on the screen as a 7. How is the ASCII symbol 7 represented in your buffer? The numeric equivalent for the ASCII symbol for 7 is decimal 55 (37 hex). (Actually the buffer contains the binary equivalent of the decimal number 55. For convenience I will refer to decimal numbers when referring to buffer contents.)Thus when you press 7, your buffer receives a decimal 55 in the appropriate memory location. Since 7 is itself a number, why isn't it sent to the buffer as a decimal 7? Because the 7 on your keyboard and the 7 on your screen are merely symbols, the ASCII symbol 7 to be precise, and this symbol has been assigned the numeric equivalent of decimal 55 in the ASCII system. Your keyboard is an ASCII device. When you press the ASCII symbol, here 7, its numeric equivalent, here decimal 55, goes marching into your buffer.

Since the numeric equivalent decimal 7 is not the equivalent of the ASCII symbol 7, you might wonder with which symbol it is tied. It is the numeric equivalent of the ASCII symbol "Control G,. Control G and its numeric equivalent decimal 7 are not generated by pressing 7. So, how is it generated? As you can see, there is not a Control G key on the Color Computer to send the decimal 7 to your buffer. The Color Computer, like all other computers, does not have 128 keys to cover all of the "standard" 128 ASCII symbols. Symbols other than those on the keyboard can only be generated in word processors or other programs that allow it. BASIC uses the CHR$ command to generate ASCII codes not available from the keyboard. VIP Writer and other word processors allow you to generate those ASCII symbols from the keyboard

One more thing should be clarified. Instead of pressing the 7 key to get an ASCII 7, can you get an ASCII 7 by pressing its numeric equivalent 55? No! By pressing the 5 key twice you generate TWO bytes of data for your buffer, both being the numeric equivalent of the ASCII symbol for 5, which is decimal 53 (35 Hex). You can't directly type the numeric equivalents of ASCII symbols in from your keyboard because your keyboard is an ASCII device.

You should now basically understand how ASCII symbols relate to their numeric equivalents. This is important for proper use of your printer since you will have to generate decimal equivalents to implement many printer functions.

### From Buffer to Printer

If you have your buffer chock full of text you want to have printed, your buffer will contain oodles of bytes, each containing a number from decimal 0 to 255 representing an individual ASCII symbol. Your printer is also programmed to work with the ASCII system, so when you commence printing, your buffer sends its numbers one by one to the printer. The printer receives the numbers and interprets them for printing.

Many of the numbers, specifically decimal 32 to 127 (the alphabet, etc.), are printed by the printer as their ASCII equivalents. Not all numbers sent to the printer, however, are intended for printing. Take the ordinary space for example. When you press the space bar, you generate the ASCII symbol for space, which ain't much. Into your buffer goes a decimal 32 (20 Hex). When the space goes to the printer, your buffer sends the decimal 32 to the printer. The printer receives the decimal 32, and in response it skips a space during printing. Thus, the decimal equivalent for the ASCII symbol for space does not have the printer "print" anything; instead, decimal 32 commands the printer to do something, i.e., skip a space.

> *"Your printer is also programmed to work with the ASCII system, so when you commence printing, your buffer sends its numbers one by one to the printer. The printer receives the numbers and interprets them for printing."*

Other ASCII symbols, and their numeric equivalents, also serve as commands to the printer. Recall that the ASCII symbols from 0 to 31 are called control symbols. These symbols were designed to be used to control functions such as turning on or off underlining, superscripts, subscripts, and different types faces. With few exceptions, smart printer manufacturers have taken these control symbols and adopted them to control certain functions within the printer. They are called control codes. This is great! By generating these control codes and putting them in your buffer you can send them to the printer while printing and control the printer functions! Now for the bad part: Although the numeric equivalents will always bring forth the same ASCII symbol, printer manufacturers do not use the same ASCII symbol and its numeric equivalent for the same printer function. This lack of uniformity requires that you carefully read your printer manual to see what the proper numeric equivalents are to implement the desired functions. This lack of standardization also stops anyone from supplying a chart showing how to uniformly affect printer functions.

A look at a typical smart printer shows that the user may choose from normal, elongated, compressed and other print modes and fonts, not to mention using superscripts, graphics and special character sets that the printer provides. To implement these functions requires that the printer be sent the proper control codes. The printer manual for your printer should have a control code summary chart which tells you which control codes will implement which functions. The chart should list the functions, and in columns next to the functions give the decimal and/or hexadecimal equivalents for the ASCII Control symbol which will implement the function. It is from this chart that you derive the control codes to use to make your printer dance.

Reading these charts can be tricky, especially since they are written by "hex heads" for hex heads. Next month I'll annotate a control code summary to help you understand what each control code is for and how to use it. I'll also explain the common printer practices to put fun back into getting your thoughts on paper.

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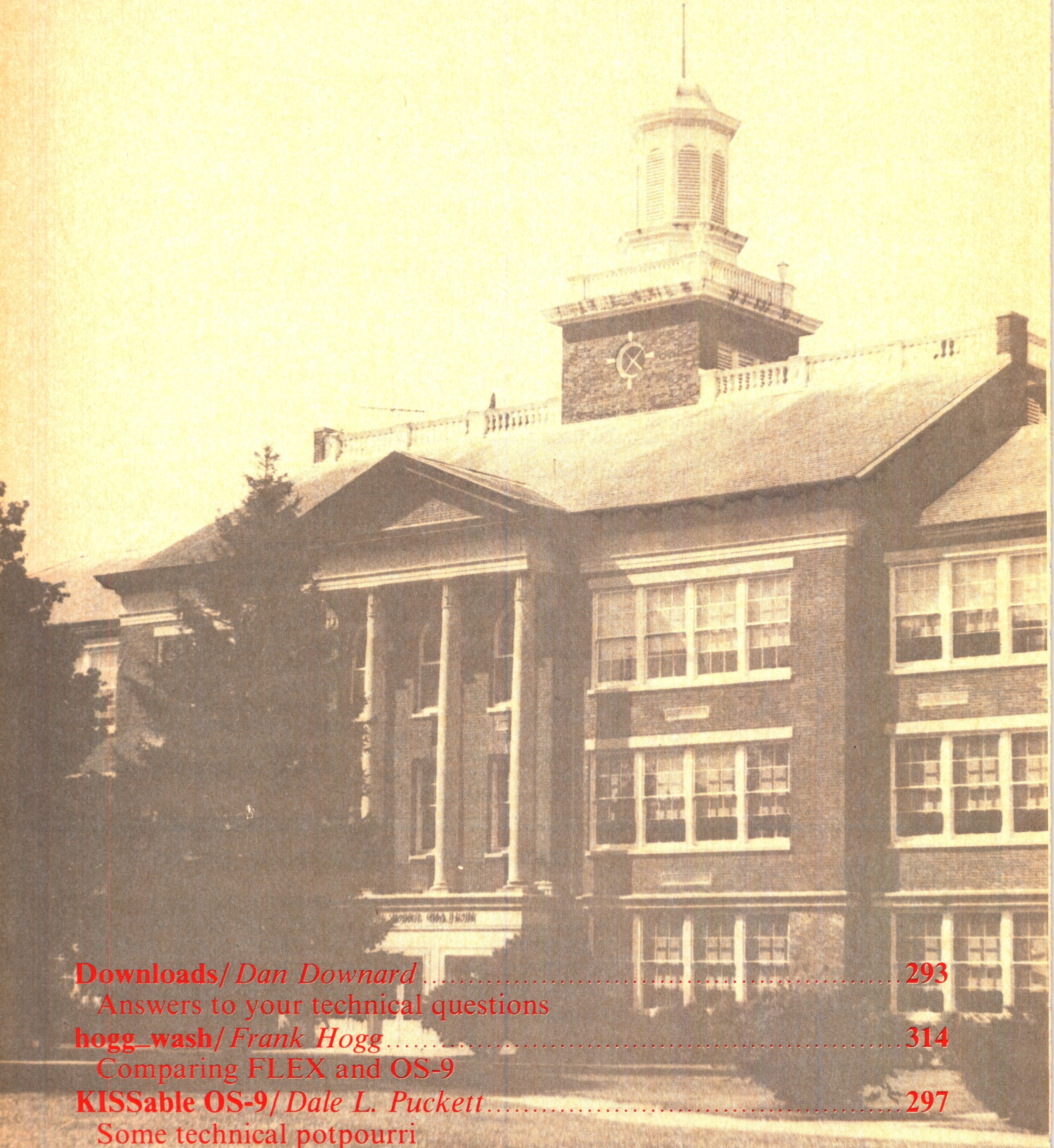

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# RAINBOWTECH DOWNLOADS

By Dan Downard
*Rainbow* Technical Editor

# Some Floating Pointers On Numerical Functions

• *I use assembly language quite often. I know that you can add or subtract 1, 2, 3 . . . from any of the registers, but what if you need to add 1.8 or 1.456? How do you divide two numbers like 45/12 and get 3.75 instead of 3? I'm trying to write a program to duplicate Extended* BASIC*'s* LINE(X,Y)-(XX,YY), PSET *command and I need to work with fractions as well as whole numbers. Any help would be appreciated.*

*Harry L. Perkins, III*
*Norfolk, VA*

The following routines in the BASIC ROMs are responsible for all math functions, Harry.

$B9B9 – Floating point subtract
FPAC1=(X)–FPAC1
$B9C2 – Floating point add
FPAC1=(X)+FPAC1
$BACA –Floating point multiply
FPAC1=(X)*FPAC1
$BB8F – Floating point divide
FPAC1=(X)/FPAC1

FPAC stands for Floating Point Accumulator. There are actually two (FPAC1 and FPAC2) memory locations reserved for these six-byte values. FPAC1 is located at $4F-$54. FPAC2 is located at $5C-$61.

Each floating point number has an exponent, a 32-bit mantissa and a sign. The exponent has $80 added to it. The mantissa is shifted by the number of bits specified by the exponent. The last bit is the sign bit. Remember that you are dealing with binary numbers.

These routines are accessed by loading the X-register with the address of a five-byte value (X). The subroutine at $BC14 is called to move (X) to FPAC1. Then, you call the desired math routine. Call $BC35 to move FPAC1 back to (X).

I would suggest that if you plan to use these routines for anything but experimentation, it would be wise to obtain a disassembly of BASIC and examine the routines from $B9B9 to $BC5E in detail.

Another suggestion is to obtain a copy of *TRS-80 Color Computer Assembly Language Programming* (RS Cat. No. 62-2077). Math subroutines are covered in several chapters.

Try adding 2+2. If it's somewhere close to 4, you're on the right track.

---

**(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio [K4KWT]. His interest in computers began about five years ago and he has built several 68XX systems.)**

## Tape To Disk Transfer

• *I have the* Super Color Writer II *which I love. I have the ROM Pack version. If I got into disks, how could I save letters and files to disk like I can to tape. I know about the Multi-Pack Interface from Radio Shack, but I thought when you switched from one to another, you disconnected all but the port you were using. However, in the November issue of* the Rainbow, *in the review of the* Voice Pak *by Bruce Rothermel, he mentions that by putting the disk controller in slot four, and the voice in slot three, you could run the disk and access the* Voice Pak. *Please help. I spent $90 on the ROM Pack version and would hate to turn around and buy the disk version of* SCWII.

*Steve Hewitt*
*Leeton, MO*

We know of no easy way to solve your dilemma, Steve, other than buying the disk version of the program. Since disk I/O is a different ball game than tape, new routines are necessary for storing programs.

Most disk-based word processors have tape I/O routines in addition to disk, so it should be no problem to transfer any of your existing files. Another approach would be to use one of several commercial programs on the market for tape-to-disk transfer of data. As long as it's in ASCII, you're okay.

---

## Cable Talk

• *I have several questions to ask you that will change my computing hobby. Here they are:*

1) *What do I need when I buy a Hayes SmartModem II, 1200 Baud, for connecting it to my CoCo 2-64K?*
2) *Is this the best modem suited for me? I live in Mexico, and the telephone line reception is not as good as in the USA on international calls. (I say international calls, because these are the calls I will make most often because that is where the major bulletin board systems are.)*
3) *The telephone system in Mexico is rotary, not digital as in the USA. Is this a problem? If so, how can it be solved?*
4) *Which would be the best modem for CoCo with regard to price and quality?*
5) *Do I need disks, or is a cassette-based system sufficient for running a modem?*

*Marcelo Luft*
*Mexico*

To connect your Hayes Modem to the CoCo, Marcelo, all you need as far as hardware is a cable obtainable from your local Radio Shack dealer. Ask for Cat. No. 26-3014. It is called a Color Computer to RS-232C Interface Cable. You may want to make your own per the following instructions:

**Connectors:**

| **CoCo** | **Modem** |
|---|---|
| 4 pin DIN | DB25P |

**Connections:**

| **CoCo** | | **Modem** |
|---|---|---|
| Pin 1 | to | Pin 8 |
| Pin 2 | to | Pin 2 |
| Pin 3 | to | Pin 7 |
| Pin 4 | to | Pin 3 |

After you get everything working on the hardware end you will need software. Look through the ads for terminal software. There are programs available for both tape and disk. Both work equally well.

The Hayes Modem you are referring to has the ability to use both tone and pulse dialing, so there should be no problems with the rotary dial system. Good luck and, after buying all this, I hope you have enough left to pay your phone bills.

---

## Clearing Up Dean's Problem

• *When I received my copy of* Rainbow On Tape *for the month of December, I* CLOADed *the program* Creator *and was amazed at what it did. (It offered the ability to type graphic letters in the graphic mode.)*

*I found that I can make graphs and charts and have the ability to add words to them. All in* PMODE4,1. *My problem is that I can't print what's on the screen to the printer. I have a 32K Extended* BASIC *CoCo and also the screen print program made available by Radio Shack. What happens is I load the machine language program,* CLEARing 200,15743. *After that, I find I don't have enough memory to run the* Creator *program. I end up with about 3,000 bits of memory.*

*Is there any way to print what I have on the screen to my printer?*

*Dean McCauley*
*Columbia, MD*

Dean, the *CLEAR200,15743* is for a 16K computer. Since you have 32K, you should *CLEAR200,32126*. The 32126 sets the top of memory for BASIC from writing over your machine language routine. By the way, 32126 is 15743 plus 16383(16K). Have fun with the *Creator*.

### Puff, A Dragon Conversion

• *I have been using a TRS-80 Color Computer (32K RAM) for one year. Many of my friends have a similar computer, a Dragon 32.*

*In order to adapt their programs to my TRS-80, I need a transformation program for conversion. My question is: How can I load my computer with two programs, one after the other, without erasing the first one?*

*I think there is a little information to give before loading the first program and before the second one, just like it is used for TRS-80 black/white, but I don't know it.*

*If you have another solution to this problem could you inform me.*

*Andre Broccart*
*Belgium*

Try the following, Andre. It is a summary of an article written by Joseph Kolar in the January '84 issue of *the Rainbow*.

Step 1 Renumber one of the programs if necessary to insure that line numbers are not duplicated.
Step 2 *CLOAD* the program with lower line numbers.
Step 3 *POKE25,PEEK(27)*
Step 4 *POKE26,PEEK(28)-2*
Step 5 *CLOAD* the program with higher line numbers.
Step 6 With Color BASIC, *POKE25,6*
With Extended BASIC, *POKE25,30*
Step 7 *POKE26,1*

Another article with a short BASIC program appeared in the October '83 *Rainbow* titled "Put 'Em Together" by Jorge Mir. This accomplishes the same thing automatically.

With Disk BASIC you can use the *MERGE* command to do the same thing as long as both programs are in an ASCII format.

### Printer Problem

• *In regard to Mr. Joe Hadley's letter concerning the use of the TP-10 printer with his "D" board Color Computer, I also have a "D" board that was 4K Color BASIC 1.0. About a year ago I piggybacked 16K chips to accomplish 32K. A few months later I installed Extended BASIC 1.1. Then, and finally to the point, I acquired a TP-10 printer and got nothing but garbage. The problem, however, does not lie with RAM but with the Color BASIC 1.0 ROM. After changing to 1.1 Color BASIC it works like a champ. I hope this helps Mr. Hadley's printer problems.*

*Larry Craddock*
*Anadarko, OK*

A similar letter was written by Dave Jenkins.

• *In reference to the letter in your column of February, 1984, where Joe Hadley was having trouble getting a TP-10 printer to work with his CoCo, I have the same configuration he has, and had the same problem. I confirmed that with a phone call to Mr. Hadley.*

*The solution is to upgrade to Color BASIC 1.1 or 1.2. This printer (and apparently, many if not all the new Radio Shack printers) will not work with the 1.0 ROM.*

*The difference, as you probably know, is that the 1.0 version sends a 7-bit word, while later versions send an 8-bit word. These printers require the 8-bit word for graphics. A 7-bit word ends up printing only graphics blocks.*

*Radio Shack upgraded my ROM for free.*

*Dave Jenkins*
*Evansville, IN*

Thanks for the info, Dave and Larry. I still recommend using 64K RAMs instead of piggybacking, though. There are several advantages, especially when you upgrade to a disk system.

### Baud Rates

• *I own a Model I and a CoCo 2. I use a DMP 400 printer for both, but I also have a Model 37 Teletype running at both 110 and 150 Baud. I am using the line feed patch that was in one of your issues but I need two others. One is to be able to add nulls for the carriage return timing, and the other is related to the characters/line of the CoCo 2. It seems that there either is not enough information in the CoCo manual or there is a bug in the ROM. When I poke the location referred to in the manual with the value for fewer characters per line, it won't work. It still prints 132 CPL, the default value.*

*Paul Eriksen*
*Newark, DE*

The poke you mention in your letter, Paul, does not add a carriage return, but inserts a delay for mechanical printers. The manuals are not very clear on this point. Fear not, the BASIC program that follows should do the trick. You can customize this program as follows:

Line 250 — change 87 to your Baud rate constant
Line 260 — change 128 to your required line delay
Line 270 — change 72 to your desired carriage width.

If a line delay is not required, simply omit line 260 from the listing. At present it's set at about ½ second. Raising this number will make it longer, and lowering it will make it shorter.

By the way, the Baud rate constant given is for 600 Baud. For 110 Baud, change line 250 to *POKE149,1:POKE150,246*. See February '84 *Rainbow*, Page 24, for a list of many common Baud rate constants.

```
100 'PRINTER DRIVER
110 CLEAR200,32716
120 DATA52,20,246,0,111,193,254
130 DATA38,20,246,0,156,92,241
140 DATA0,155,39,16,129,13,38
150 DATA7,190,160,2,173,3,134
160 DATA10,53,20,57,0,0,52,2,134
170 DATA13,190,160,2,173,3,134
180 DATA10,173,3,53,2,32,234
190 FOR D=32717TO32767
200 READ E:POKE D,E:NEXT D
210 POKE32748,PEEK(359)
220 POKE32749,PEEK(360)
230 POKE32750,PEEK(361)
240 POKE359,126:POKE360,127:
    POKE361,205
250 POKE150,87
260 POKE151,128
270 POKE155,72
280 END
```

### Conversion Problem

• *I have a question regarding converting Model I/III programs to Color BASIC. For the most part they will run directly with minor modifications to print locations, Low-Res graphics, etc. However, I have difficulty with single/double precision variables and poke commands. Do you know of any type of BASIC or machine language conversion routines for single/double precision variables or equivalent Model I/III/Color BASIC poke commands as well as any other unforseen conversion problems?*

*Mark Rennebaum*
*Sierra Vista, AZ*

For those readers who are not familiar with the Model I, Mark, let's summarize the three types of numerical variables.

| | | |
|---|---|---|
| A% | — Integer Variable | Whole Number |
| A! | — Single Precision | 7 Significant Digits |
| A# | — Double Precision | 17 Significant Digits |

The Color Computer has only one form of numerical variable, single precision. I've had no trouble converting programs by just omitting the modifier. One thing that may cause problems is the fact that all three of the above examples are distinct variables, even though they start with "A." Just change the name of the variable to another unused symbol.

The poke statements you are referring to are a different story. Some are loading machine language programs into memory. They will not work on the CoCo. Some are for modifying BASIC pointers. To find the equivalent pokes for the CoCo, if they even exist, will require disassemblies of both Color and Level II BASIC. Some Model I programs I have seen use pokes for buffer storage. If that's the case just pick an unused section of RAM in the CoCo and continue using the same poke with a different address.

Watch out for the *DEFFN(X)* function. It is different for each computer. Obviously, all of your *PRINT@* locations will have to be changed along with *LPRINT* if printer output is required.

The above hints are only a few of the things to look out for, Mark. What is really necessary is a thorough understanding of BASIC for both computers.

**Your technical questions are welcomed. Please address them to: Downloads, *the Rainbow*, P.O.Box 209, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity.**

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| | | |
|---|---|---|
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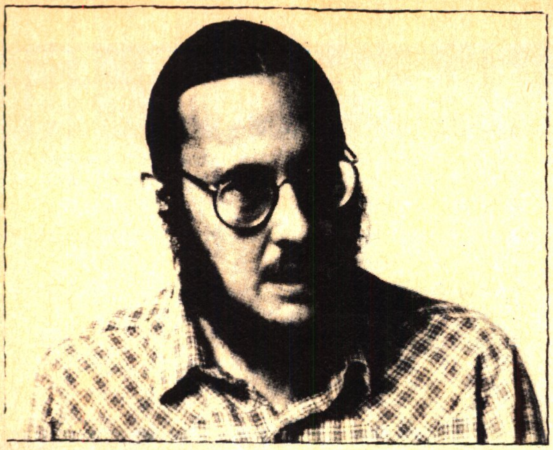

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I put jargon in its place, too. If you've ever been intimidated by genius programmers, you'll know what I mean. You'll be able to drop a few accumulators, registers, and zero-indexed offsets into your conversation, too.

So contact me or RB2-3 at Green Mountain Micro. "Micro Language Lab" comes in a notebook containing twelve cassettes, documentation, workbook, and data booklets. It costs $99, plus $4.50 shipping and handling. Z80 and 6502 Labs will be available shortly.

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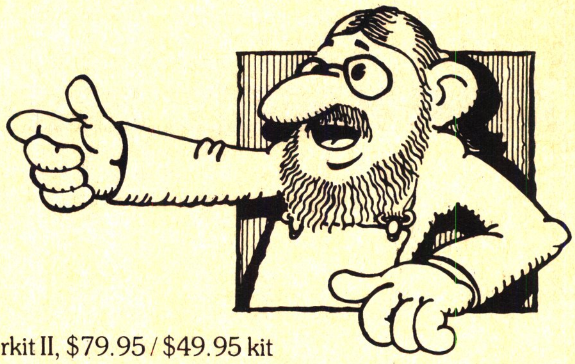

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## KISSABLE OS-9

# Sad News, Good News, A Successful Terminal Program And Some BASIC09 Tricks

**By Dale L. Puckett**
***Rainbow* Contributing Editor**

The OS-9 community suffered a tremendous loss when Jim Bellomo died of a heart attack at the age of 34. Jim was one of OS-9's strongest proponents and established the OS-9 SIG on CompuServe. Everyone who read the message that weekend was shocked. Perhaps Jim's close friend, Phil Mongelluzzo, said best what we all felt:

> As one of Jim's closest friends I cannot begin to express the admiration that I held for Jim. Perhaps the OS-9 SIG can become a living memorial of Jim's efforts. With the help of all of you, I am confident that we can continue the effort Jim began and create the knowledge base of OS-9 experts that Jim dreamed of.

CompuServe has assigned Wayne Day, the SYSOP of The Color SIG, as temporary SYSOP of the OS-9 SIG. Wayne has assured members of the group that they will have continued access to the OS-9 User's Group Software Exchange library on database XA-4 and has arranged to have the remainder of the software library uploaded. By the way, my CompuServe User Number is 71446,736 if you ever need to reach me.

*"Step by step my trusty CoCo went through the motions needed to compile a program."*

### Tandy's C Compiler Arrives

I received an exciting Express Mail package from Jim Reed at *the Rainbow* this weekend. I immediately backed up the disk's containing Microware's C and compiled my first program.

```
main()
     {
     int sum, x, y;
     x = 20;
     y = 30;
     sum = x + y;
     printf("This is my first 'C' pro-
     gram./n");
     printf("The sum of %d and %d =
     %d",x,y,sum");
     }
```

I realize it doesn't do too much. But it compiled perfectly and ran the first time. It was quite a sight to watch. To compile the program I typed the line:

```
OS9:cc1 C_Test.c
```

Step by step my trusty CoCo went through the motions needed to compile a program. In several minutes it ran these programs.

| | |
|---|---|
| c.prep | (a macro pre-processor) |
| c.pass1 | (OS-9 Level I systems) |
| c.pass2 | (require two passes) |
| c.opt | (the assembly code is optimized) |
| c.asm | (and assembled by a relocating assembler) |
| c.link | (and finally linked by a linkage editor) |

---

*(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He just completed his first book,* The Official BASIC09 Tour Guide, *this summer. It is being published by Microware and will be available this fall. He is the author of* DynaSpell, Readtest, Esther *and* Help, *which are available from Frank Hogg Laboratories. He serves on the Info World Software Review Board and is a Chief Warrant Officer in the U.S. Coast Guard.)*

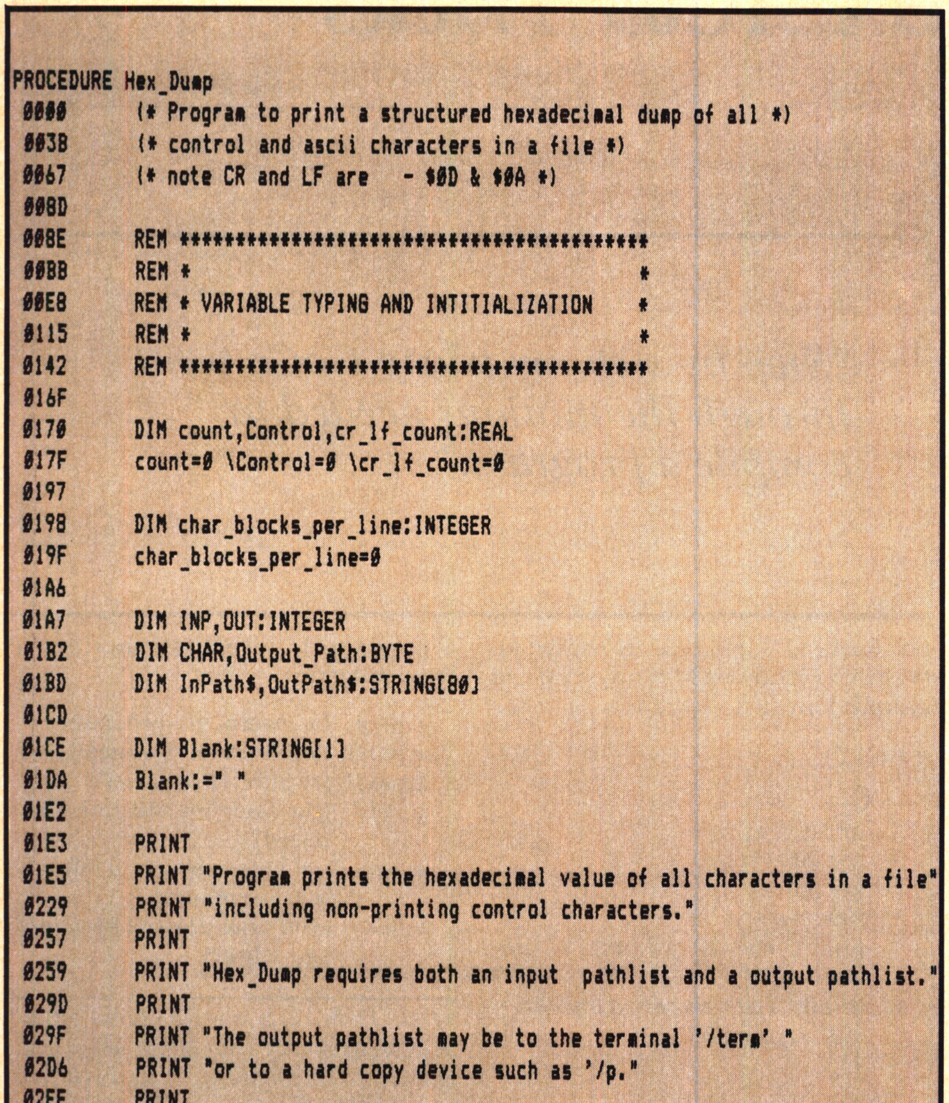
It's not interactive like BASIC09, but it sure is an effective package. Written by James McCosh, author of several 6809 C compilers, this language is implemented almost exactly as described in *The C Programming Language* by Kernighan and Ritche. Bit fields are the only thing missing. Other differences between the C description in K & R and the Color Computer C can be counted with the fingers on one hand and they all reflect parts of C that are obsolete or constraints imposed by memory size limitations.

C is not one of the most elegant languages around but it gives you a solution to a lot of different problems. It is sort of a high-level assembly language.

One of the things C does have going for it is the fact that its code is highly transportable. You can write a program on the Color Computer and carry it over to an IBM PC for example. C's language and power can be attributed to the fact that most C programmers use libraries, written in C, which can be adapted to any environment.

One real plus for Tandy's C is the fact that it supports almost all the system calls for both OS-9 and UNIX. This means you can write a C program on the Color Computer, port the source code to a 68000 computer running UNIX, compile it there and run it. Not bad.

> *"One real plus for Tandy's C is the fact that it supports almost all the system calls for both OS-9 and UNIX."*



```
PROCEDURE Hex_Dump
 0000      (* Program to print a structured hexadecimal dump of all *)
 003B      (* control and ascii characters in a file *)
 0067      (* note CR and LF are   - $0D & $0A *)
 008D
 008E      REM ****************************************
 00BB      REM *                                      *
 00E8      REM * VARIABLE TYPING AND INTITIALIZATION   *
 0115      REM *                                      *
 0142      REM ****************************************
 016F
 0170      DIM count,Control,cr_lf_count:REAL
 017F      count=0 \Control=0 \cr_lf_count=0
 0197
 0198      DIM char_blocks_per_line:INTEGER
 019F      char_blocks_per_line=0
 01A6
 01A7      DIM INP,OUT:INTEGER
 01B2      DIM CHAR,Output_Path:BYTE
 01BD      DIM InPath$,OutPath$:STRING[80]
 01CD
 01CE      DIM Blank:STRING[1]
 01DA      Blank:=" "
 01E2
 01E3      PRINT
 01E5      PRINT "Program prints the hexadecimal value of all characters in a file"
 0229      PRINT "including non-printing control characters."
 0257      PRINT
 0259      PRINT "Hex_Dump requires both an input  pathlist and a output pathlist."
 029D      PRINT
 029F      PRINT "The output pathlist may be to the terminal '/term' "
 02D6      PRINT "or to a hard copy device such as '/p."
 02FF      PRINT
 0301      PRINT "The pathlists must be entered without quotes."
 0332      PRINT
 0334
 0335      REM Program was written By David R. P. Gibson
 0361      REM " (703) 285 - 2378"
 0377
 0378      INPUT "Enter input file pathlist :",InPath$
 039B 5    INPUT "Enter output file pathlist:",OutPath$
```

Microware makes this possible by using UNIX names for system functions, even though the same OS-9 function might have a different name. And sometimes, there are UNIX functions that do not have an exact equivalent OS-9 function. In that case, Microware gives you a library function to simulate it. Finally, when there is an OS-9 function that does not have a UNIX equivalent, OS-9 names are used.

This C also has an optional profiler which can be used to determine how many times a particular function is executed when a program is being run. This means you can identify the most frequently used functions. You can then study them in an attempt to find a more efficient algorithm.

### New *Dynastar* Being Shipped

I also received the final version of the *DynaStar* text editor from FHL this weekend. Couldn't resist giving it a spin.

I was amazed at the speed of this editor. *DynaStar* automatically configures itself to the size of the Hi-Res screen you happen to be running at the time you call it. But here's the best part: You can have a document with column widths up to 250. It's amazing, when the cursor gets to the last position in the line the entire screen (except for the menu at the top) jumps to the left eight positions. If you move the cursor back, it moves back. It seems to work just like the Wang system at work.

Another cute feature is a second cursor which moves along in the ruler line above your text. It always points to your postion in the line and is really good if your are a character counter. Also, *DynaStar* comes alive with its help menus on. You don't even need a manual to run this program. All the information is on the screen in front of you. Then, when you have the operation down pat and don't need the information on the help menu, you just toggle it off and you can use all but one line of the screen for text.

## About That External Terminal Problem

You're in luck this month. We have two solutions to the problems you've been having trying to run an external terminal as device /t1. We mentioned several months ago that you could only get reliable operation at 300 Baud.

One solution comes from Ray Nicklas a member of the Color Computer Users group of Melville, Long Island, N.Y. Ray is 36 and holds a BSEE from Hofstra and a MSCS from Polytechnic Institute of New York. He provided this table which shows changes you can make to the device driver PRINTER. Ray says that with these changes his CoCo has never failed at 9600 Baud.

**PRINTER**

| Offset | From | To | Baud Rate |
|---|---|---|---|
| 5F | 0485 | 0482 | 110 |
| 61 | 01A5 | 01A2 | 300 |
| 63 | 00D0 | 00CD | 600 |
| 65 | 0066 | 0063 | 1200 |
| 67 | 0030 | 002D | 2400 |
| 69 | 0016 | 0013 | 4800 |
| 6B | 0008 | 0005 | 9600 |

Also make the following changes that assure that the bit-time for both a zero and a one will be the same.

| Offset | From | To |
|---|---|---|
| 9F | C6 | 12 |
| A0 | 02 | C6 |
| A1 | 25 | 00 |
| A2 | 01 | 59 |
| A3 | 5F | 58 |
| AD | F1 | F2 |

The original CRC (the last three bytes in the module) was FEF3EA. After these changes the new CRC should be 741EC6. The Baud rate constants in the module RS-232 which drives /t1 are the same as those listed above. Find them with your debugger and makes similar changes and you'll be in business. You shouldn't need to change the big bang routine in RS-232. As Ray said in his letter, "Only a purist would do that."

```
03C1
03C2       REM On my system, the dot matrix printer is /p
03EF       REM the letter quality printer is /p3 and
0418       REM the crt is /term. If your system has other devices,
044F       REM the IF statement should be modified to include them
0485
0486       IF OutPath$<>"/p" AND OutPath$<>"/p3" AND OutPath$<>"/term"

            THEN
04AA         PRINT "Output must be directed to /p or /p3 or /term (crt)."
04E2         PRINT "Try again!"
04F0         GOTO 5
04F4       ENDIF
04F6
04F7       REM ********************************************
0528       REM *                                          *
0559       REM * The real work in the program begins here *
058A       REM *                                          *
05BB       REM ********************************************
05EC
05ED       PRINT
05EF       OPEN #INP,InPath$:READ
05FB       OPEN #Output_Path,OutPath$:WRITE
0607
0608       WHILE EOF(#INP)=FALSE DO
0614         GET #INP,CHAR
061E         char_blocks_per_line=char_blocks_per_line+1
0629         count=count+1
0635
0636         IF CHAR<$20 OR CHAR=$7F THEN
064B           IF CHAR=$0D OR CHAR=$0A THEN
0660             cr_lf_count=cr_lf_count+1
066C           ENDIF
066E
066F           PRINT #Output_Path USING "'[',H2,']',S1",CHAR,Blank;
068E           Control=Control+1
069A         ELSE
069E           PRINT #Output_Path USING "'[',H2,']',S1",CHAR,Blank;
06BD         ENDIF
06BF
06C0         IF char_blocks_per_line>=16 THEN
06CC           PRINT #Output_Path
06D2           char_blocks_per_line=0
06D9         ENDIF
06DB
06DC       ENDWHILE
06E0       CLOSE #INP
06E6
06E7       REM echo statistics to hard copy device
070D
070E       PRINT #Output_Path USING "S1",Blank
071D       PRINT #Output_Path USING "'Total Number of Characters = ',R10.1,S1"

            ,count,Blank
0756       PRINT #Output_Path USING "'Found Total of ',R10.1,' control characters
           in file.',S1"
            ,Control,Blank
07A0       PRINT #Output_Path USING "'Of which some  ',R10.1,'were <CR> or <LF>. '
           ,S1"
```

```
          ,cr_lf_count,Blank
 07E1       PRINT
 07E3
 07E4       CLOSE #Output_Path
 07EA       END




PROCEDURE New_Hex_Dump
 0000       (* Program prints a structured hexadecimal dump of all *)
 0039       (* control and ascii characters in a file *)
 0065
 0066       DIM count,Control,cr_lf_count:REAL
 0075       count=0 \Control=0 \cr_lf_count=0
 008D
 008E       DIM char_blocks_per_line:INTEGER
 0095       char_blocks_per_line=0
 009C
 009D       DIM InPath,OutPath,ErrorPath:BYTE
 00AC       InPath:=0 \OutPath:=1 \ErrorPath:=2
 00C1
 00C2       DIM CHAR:BYTE
 00C9
 00CA       DIM Blank:STRING[1]
 00D6       Blank=" "
 00DE
 00DF       ON ERROR GOTO 10
 00E5
 00E6       PRINT #OutPath
 00EC
 00ED       WHILE EOF(#InPath)=FALSE DO
 00F9         GET #InPath,CHAR
 0103         char_blocks_per_line=char_blocks_per_line+1
 010E         count=count+1
 011A
 011B         IF CHAR<$20 OR CHAR=$7F THEN
 0130           IF CHAR=$0D OR CHAR=$0A THEN
 0145             cr_lf_count=cr_lf_count+1
 0151           ENDIF
 0153           PRINT #OutPath USING "'[',H2,']',S1",CHAR,Blank;
 0172           Control=Control+1
 017E         ELSE
 0182           PRINT #OutPath USING "'[',H2,']',S1",CHAR,Blank;
 01A1         ENDIF
 01A3
 01A4         IF char_blocks_per_line>=16 THEN
 01B0           PRINT #OutPath
 01B6           char_blocks_per_line=0
 01BD         ENDIF
 01BF
 01C0       ENDWHILE
 01C4
 01C5 10    PRINT #ErrorPath,Blank
 01D2       PRINT #ErrorPath
 01D8       PRINT #ErrorPath,"Total number of characters = "; count
 0202       PRINT #ErrorPath,"Found "; Control; " control characters in file."
 0234       PRINT #ErrorPath,"Of which "; cr_lf_count; " were  <CR> or <LF> "
 0261
 0262       END
```

## Ray's New Disk Drivers

Ray is also the proud author of a new disk driver module for CoCo. He calls it *CCDISKrev2* and it supports double stepping for 48 tracks per inch media on a 96 track per inch drive as well as real time clock compensation. And, he packed it all into 982 decimal bytes. I just did an ident on *SDISK* for comparison purposes. It is 1,194 decimal bytes long.

The new module increases the disk storage capacity, lowers the access time and is also standard OS-9 compatible. It determines the step rate by reading the device descriptor and will work at 6, 12, 20, and 30 ms with the appropriate drives. Double-sided drives are supported as are 80-track (96 tpi) drives and Ray noted that three 80-track drives will give you 8,640 sectors.

> *"These drivers adjust the motor startup delay and the head settling delay according to the step rate, a fine tuning that should give you super disk performance."*

These drivers adjust the motor startup delay and the head settling delay according to the step rate, a fine tuning that should give you super disk performance. They also write single- and double-density disks. Ray told me he hoped to license these drivers through FHL so you most likely will see them bundled with other OS-9 support software soon.

## And, A Format Patch

Load the standard Radio Shack Format utility and then use the Debugger to make the following changes.

| Offset | Old | New | |
|---|---|---|---|
| 1A3 | 13 | 49 | (to recognize tracks) |
| 1A8 | 2C | 2A | (for * to cause single-sided operation) |
| 1A9 | 00 | 01 | |
| 1AB | 0B | 0F | |
| A85 | 18 | A0 | (CRC) |
| A86 | 99 | 8C | |
| A87 | C1 | 39 | |

```
PROCEDURE Strip
 0000      (* Program to strip off all control characters in a file *)
 003B      (* Except CR's and LF's   - $0D & $0A *)
 0063      (* written for David R.P. Gibson      *)
 008B      (* modified by David R. P. Gibson to include *)
 00BA      (* deletion of $7F (DEL) *)
 00D5
 00D6      DIM count,Control:REAL
 00E1      DIM INP,OUT:INTEGER
 00EC      DIM CHAR:BYTE
 00F3      DIM InPath$,OutPath$:STRING[80]
 0103
 0104      PRINT
 0106      PRINT "This program strips off all control characters in a file"
 0142      PRINT "except CR's and LF's."
 015B      PRINT
 015D
 015E      Control=0 \count=0
 016E
 016F      INPUT "Enter input file pathlist :",InPath$
 0192      INPUT "Enter output file pathlist:",OutPath$
 01B5
 01B6      PRINT
 01B8
 01B9      OPEN #INP,InPath$:READ
```

Then, type the following command with a new disk in device /d1.

OS9: format /d1 * (35) R "Your Name"

This command should format a single-sided, 35-track disk (even on a double-sided 40-track drive). Also, using a letter "C" (instead of an R) in the command line should cause the disk to be in the CoCo format, even though your Device Descriptor is set to Standard OS-9 format. One caution goes with Ray's changes here, however. Track 0, Side 0 sector value *must* agree with the number of sectors per track, i.e., they both must be 18.

## Now, An Interrupt Driven Device Driver For /T1

We got a nice letter and a piece of code you'll love from Ivan Helmrich in Cambridge, Mass. Ivan sent me source and object code for an interrupt driven RS-232 driver that works on a stock Color Computer.

Being skeptical as usual, I plugged in my TeleVideo terminal using the null modem cord Bob Rosen sent me and fired up the CoCo. Lo and behold, it

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worked at 19,200 Baud. Wow!

Ivan used a few pieces of code from Microware's standard ACIA drivers so he was afraid we wouldn't be able to publish the code for you. I got on the line with Microware immediately and Ken Kaplan was kind enough to give us permission to publish it. If you want to use a real terminal on your CoCo you'll be thanking him for a long time.

In his letter Ivan said that normally the RS-232 input won't throw an interrupt, but by tying the CD line (pin 1) to the RS-232 input line (pin 2), you can generate an interrupt. This causes a FIRQ on the start bit on an incoming word. Since CoCo OS-9 doesn't use the FIRQ, Ivan supplied a vector to them in the driver's Init routine. Enjoy!

```
01C5      CREATE #OUT,OutPath$:WRITE
01D1
01D2      WHILE EOF(#INP)=FALSE DO
01DE        GET #INP,CHAR
01E8        count=count+1
01F4        IF CHAR<$20 OR CHAR=$7F THEN
0209          IF CHAR=$0D OR CHAR=$0A THEN
021E            PUT #OUT,CHAR
0228          ELSE
022C            Control=Control+1
0238          ENDIF
023A        ELSE
023E          PUT #OUT,CHAR
0248        ENDIF
024A      ENDWHILE
024E
024F      CLOSE #INP
0255      CLOSE #OUT
025B
025C      PRINT
025E      PRINT "Total number of characters = "; count
0283      PRINT "Stipped off "; Control; " control characters from file."
02B8      PRINT
02BA      END


PROCEDURE NewStrip
 0000      (* A program to strip off all control characters in a file *)
 003D      (* except CR's, LF's and DEL's *)
```

## Speaking Of New Packages

I received a care package from Richard Don at GIMIX last month also. Seems he is now shipping *RMS*, a powerful OS-9 database manager and DO, a procedure language with his computers now. I hope to review them for you sometime in the future. I have also been told that Computerware has a package of OS-9 utilities out that give you a

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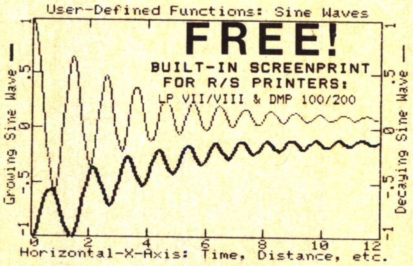

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```
005E
005F         (* modified by Dale L. Puckett to get its input and output *)
009C         (* from standard input and standard output *)
00C9
00CA         DIM count,Control:REAL
00D5         DIM CHAR:BYTE
00DC         DIM InPath,OutPath,ErrorPath:BYTE
00EB
00EC         InPath:=0
00F3         OutPath:=1
00FA         ErrorPath:=2
0101
0102         Control=0 \count=0
0112
0113         ON ERROR GOTO 10
0119
011A         WHILE EOF(#InPath)=FALSE DO
0126           GET #InPath,CHAR
0130           count=count+1
013C           IF CHAR<$20 OR CHAR=$7F THEN
0151             IF CHAR=$0D OR CHAR=$0A THEN
0166               PUT #OutPath,CHAR
0170             ELSE
0174               Control=Control+1
0180             ENDIF
0182           ELSE
0186             PUT #OutPath,CHAR
0190           ENDIF
0192         ENDWHILE
```

selective directory copy and a patch to *CCDISK*. We hope to take a look at those for you next month.

### BASIC09 Programs And Tips

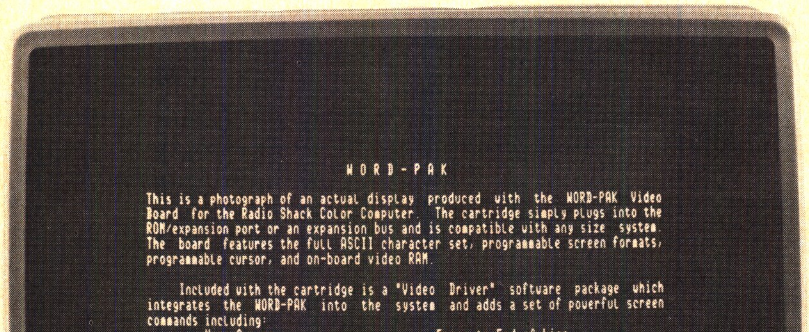
Dave Gibson at Federal Highways in McLean, Va., the new acting secretary of our OS-9 users group gave me a couple of programs for our software exchange last week. They gave me an idea that I would like to share with you. First, the programs.

STRIP is a very useful program that will remove all control characters from a file except the carriage return and line feed. You'll find you need a utility like this when talking to some mainframe computers or bulletin boards.

HEX_DUMP prints the hexadecimal values of all characters in a file, including non-printing control characters. This is helpful when you are trying to find out why a program bombed.

Both of these programs work in a conventional manner. They come alive, print a billboard and then ask you for a file name, etc. I wondered if it was possible to make them work like other OS-9 and UNIX utilities from within BASIC09.

A PICTURE IS WORTH . . .



```
                          W O R D - P A K

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```
0196
0197 10    PRINT #ErrorPath
01A0       PRINT #ErrorPath,"Total number of characters = "; count
01CA       PRINT #ErrorPath,Control; " control characters were stripped from file."
0203       PRINT #ErrorPath
0209       END



00001
00002
00003       * Interrupt driven RS-232 driver
00004
00005                          NAM   SERIAL
00006                          IFP1
00009                          ENDC
00010
00011   0020           OVERUN  SET   $20
00012   00E1           TYPE    SET   DRIVR+OBJCT
00013   008C           INPSIZ  SET   140
00014   0011           XONC    SET   $11
00015   0013           XOFFC   SET   $13
00016   04CC           B110    SET   $4CC
00017   01C0           B300    SET   $1C0
00018   00DF           B600    SET   $DF
00019   006F           B1200   SET   $6F
00020   0037           B2400   SET   $37
00021   001B           B4800   SET   $1B
00022   000E           B9600   SET   $0E
00023   0007           B19200  SET   $07
00024
00025 D 001D                   ORG   V.SCF
00026 D 001D           DELAY   RMB   2
00027 D 001F           INXTI   RMB   1
00028 D 0020           INXTO   RMB   1
00029 D 0021           INCNT   RMB   1
00030 D 0022           INHALT  RMB   1
00031 D 0023           HALTED  RMB   1
00032 D 0024           TEMP    RMB   2
00033 D 0026           TEMP1   RMB   1
00034 D 0027           DUMMYA  RMB   2
00035 D 0029           DUMMYM  RMB   75
00036 D 0074           INPBUF  RMB   INPSIZ
00037 D 0100           SERMEM  EQU   .
00038
00039   0001           H.XOFF  EQU   1
00040   0002           H.EMPTY EQU   2
00041
00042   0000 87CD025D          MOD   SEREND,SERNAM,TYPE,REENT+2,SERENT,SERMEM
00043   000D 03                FCB   UPDAT.
00044   000E 52533233  SERNAM  FCS   "RS232"
00045   0013 01                FCB   1
00046
00047 W 0014 16000F    SERENT  LBRA  INIT
00048 W 0017 160071            LBRA  READ
00049   001A 1600B4            LBRA  WRITE
00050   001D 160135            LBRA  GETSTA
00051   0020 16013C            LBRA  SETSTA
00052   0023 16013D            LBRA  TERM
00053
```

I wanted to be able to send data to them through a pipe and have them output data into a pipe.

I knew that to do this, I would need to program them so that they received their data from the standard input (0) and standard output (1) paths. I also imagined that when I needed a message on the terminal during the process I would be able to use the standard error output path (2).

---

> *"Remember, you must always* SAVE *a BASIC09 procedure before you* PACK *it."*

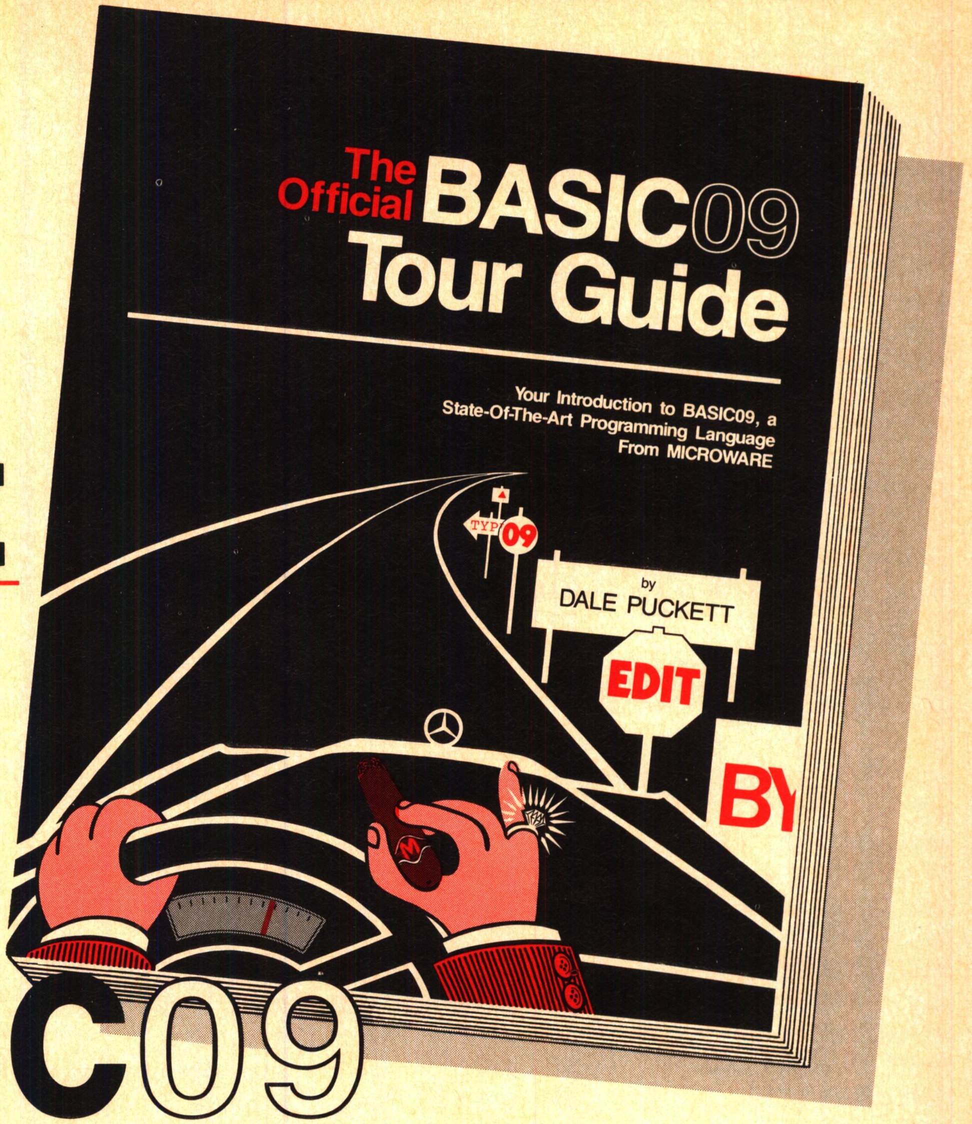
---

To accomplish this, I edited the files, removing the prompts for the filenames and the input statements, etc. Then I *SAVEd* my source code in my working data directory and *PACKed* the procedures into my working execution directory (/d0/cmds) in this case. Remember, you must always *SAVE* a BASIC09 procedure before you *PACK* it. If you don't, you will have lost your source code forever.

I tried several different command lines to see if my ideas would work. First, just to save time for my series of experiments, I loaded BASIC09's run time package, RUNB, and the two packed modules, New_Hex_Dump and NewStrip. Here are a few of the commands I tried. They all worked. Hope you enjoy and apply this technique to your BASIC09 programming.

```
OS9: load runb
OS9: load new_hex_dump
OS9: load NewStrip
OS9: list /d0/sys/password !
       new_hex_dump
OS9: list /d0/cmds/dir ! NewStrip !
       New_Hex_Dump
OS9: list /d0/cmds/list !
       New_Hex_Dump >/p
OS9: list /d0/cmds/dir !
       New_Hex_Dump >DirDump
OS9: New_Hex_Dump </d0/cmds
       /dir >NewDirDump
```

# Get the most out of BASIC09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```
  0026 3401        INIT     PSHS   CC
  0028 1A50                 ORCC   #$50       Kill Interrupts
  002A 8EFF20               LDX    #$FF20     Get addr of device to set up
  002D 6F01                 CLR    1,X        Data direction
  002F 86FE                 LDA    #$FE       Prepare to set RS-232 lines
  0031 A784                 STA    0,X        Mostly Output
  0033 8636                 LDA    #$36       Data register
  0035 A701                 STA    1,X
  0037 3501                 PULS   CC         Enable Interrupts
  0039 4F                   CLRA
  003A 5F                   CLRB
  003B EDC81F               STD    INXTI,U    Initialize Storage
  003E 6FC823               CLR    HALTED,U
  0041 6FC822               CLR    INHALT,U
  0044 6FC821               CLR    INCNT,U
  0047 8611                 LDA    #$XONC
  0049 C613                 LDB    #$XOFFC
  004B ED4F                 STD    V.XON,U
  004D 308D0208             LEAX   ENDUM2,PCR Get end of dummy routine to mo
  0051 AFC824               STX    TEMP,U     Hold this value
  0054 31C829               LEAY   DUMMYM,U   Get start of Static storage fo
  0057 10AFC827             STY    DUMMYA,U   Hold this value to use as a ve
  005B 308D01B4             LEAX   DUMMY,PCR  Get the start of the routine

         *THIS NEXT SECTION TRANSFERS THE ROUTINE TO STATIC STORAGE*

  005F A680        SETLOP   LDA    ,X+        Proceed with the transfer
  0061 A7A0                 STA    ,Y+        Store the byte
  0063 ACC824               CMPX   TEMP,U     End of the dummy routine?
  0066 23F7                 BLS    SETLOP     no
  0068 3139                 LEAY   -7,Y       Fix up Y for the terminating j
  006A 308D0119             LEAX   SRIRQ0,PCR Get the address to jump to
  006E AFA4                 STX    ,Y         Put it in the routine
  0070 1A50                 ORCC   #$50       Kill the interrupts for a bit
  0072 30C829               LEAX   DUMMYM,U   Prepare the pointer
  0075 AFC827               STX    DUMMYA,U   Put the pointer in storage
  0078 30C827               LEAX   DUMMYA,U   Get address of pointer
W 007B BF0127               STX    $127       Put it in the vector table
  007E 1CAF                 ANDCC  #%10101111 Enable the interrupts
W 0080 B6FF20               LDA    $FF20      This clears INT flag
  0083 8635                 LDA    #$35       Prepare to enable interrupt fr

         *THIS CONFIGURES THE PORT TO THROW A FIRQ ON THE START BIT*

W 0085 B7FF21               STA    $FF21      Do it
  0088 39          INIT9    RTS

  0089 8D36        READ00   BSR    SLEEP
  008B 17009A      READ     LBSR   BDLOOP     Set up the Baud delay
  008E A6C822               LDA    INHALT,U   Is input halted?
  0091 2F0E                 BLE    READ8      If not go ahead
  0093 E6C821               LDB    INCNT,U    If so, check to see if it is t
  0096 C10A                 CMPB   #10        Close enough to empty?
  0098 2207                 BHI    READ8      If not, move on
  009A E64F                 LDB    V.XON,U    Prepare to send XON Character
  009C CA80                 ORB    #SIGN      This activates the flag
  009E E7C822               STB    INHALT,U   Flag input resume
  00A1 E6C820      READ8    LDB    INXTO,U    Get the next out pointer
  00A4 30C874               LEAX   INPBUF,U   Get the start of the buffer
  00A7 1A50                 ORCC   #$50       Kill interrupts while operatin
```

Note that you do not have to load these modules or RUNB before you run them. If you type a name in the OS-9 command line and the program isn't already in the module directory, OS-9 will look for it in your current execution directory. When it loads a module and finds that it is a BASIC09 I-code (for intermediate) module it attempts to link to the module RUNB. If it finds that RUNB is not in memory, it will automatically load it from your current execution directory. Of course, you are responsible for making sure that it is in this directory.

> *"Here's a nice trick you can use when using* PACKed *BASIC09 I-code procedures."*

### BASIC09 Input From The Standard Path

Here's a nice trick you can use when using *PACKed* BASIC09 I-code procedures. We credit it to Carl Kreider, a regular visitor to the CompuServe OS-9 SIG.

In addition to using the standard paths, 0, 1, and 2 as in the listings above, Carl suggests that you try this line when you need to input data into a *PACKed* procedure from the standard input path. For example, maybe your procedure needs to get its instructions from a procedure file.

```
INPUT "",instruction
```

The secret here is that the null string, i.e., "" causes BASIC09 (or RUNB in this case) to suppress the prompt that it normally prints for an input statement. Thanks Carl.

Here's another tip. Cor Dikland asked how he could input a keystroke into BASIC09 when that key did something obnoxious like clear the screen. In his words, "When using *INKEY$* or *GET0* in BASIC09, the key pressed is printed. This is very annoying, especially when using the up-arrow key as it clears the screen. Is there a way to prevent this from happening?" Cor, try this.

```
Shell "tmode -echo"
Get 0, character
Shell "tmode echo"
```

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```
00114   00A9 E1C81F          CMPB  INXTI,U   Check to see if buffer is empt
00115   00AC 27DB            BEQ   READ00    If so, go and wait a bit
00116   00AE 3A              ABX             Get pointer to next out in X-R
00117   00AF A684            LDA   ,X        Get character
00118   00B1 6AC821          DEC   INCNT,U   Drop the count
00119   00B4 5C              INCB            Advance the next out pointer
00120   00B5 C18B            CMPB  #INPSIZ-1 End of Buffer?
00121   00B7 2301            BLS   READ10    No
00122   00B9 5F              CLRB            Reset if End
00123   00BA E7C820  READ10  STB   INXTO,U   Update the pointer
00124   00BD 5F              CLRB            Clear carry
00125   00BE 1CAF    READ90  ANDCC #%10101111 Enable Interrupts
00126   00C0 39              RTS
00127
00128   00C1 3416    SLEEP   PSHS  D,X
00129   00C3 A644            LDA   V.BUSY,U  Get the process Id
00130   00C5 A745            STA   V.WAKE,U  This is the process to wake up
00131   00C7 1CAF            ANDCC #%10101111 Enable the Interrupts
00132   00C9 8E0000          LDX   #0        indefinite sleep period
00133   00CC 103F0A          OS9   F$SLEEP   Take a snooze
00134   00CF 3596            PULS  D,X,PC
00135
00136   00D1 E6C822  WRITE   LDB   INHALT,U  Do we want to send an XOFF?
00137   00D4 2A0D            BPL   WRITE1    No
00138   00D6 C47F            ANDB  #^SIGN    Clear Flag
00139   00D8 E7C822          STB   INHALT,U
00140   00DB 3402            PSHS  A         Hold the original character
00141   00DD 1F98            TFR   B,A       We will send special character
00142   00DF 8D02            BSR   WRITE1    Go send it
00143   00E1 3502            PULS  A         Get back original
00144   00E3 8D43    WRITE1  BSR   BDLOOP    Get the timing values
00145   00E5 255B            BCS   BR1       If Error in timing setup get o
00146   00E7 E6C823  WRITE2  LDB   HALTED,U  Check Flag
00147   00EA C401            ANDB  #$01      Check Bit0
00148   00EC 2708            BEQ   WRITE3    We can send
00149   00EE 8E0001          LDX   #$01      We can't send, so sleep for a
00150   00F1 103F0A          OS9   F$SLEEP
00151   00F4 20F1            BRA   WRITE2    Try it again
00152
00153   00F6 C609    WRITE3  LDB   #$9       Get number of bits to write
00154   00F8 3405            PSHS  B,CC      Store bit count
00155   00FA 1A50            ORCC  #$50      Kill interrupts
00156   00FC 1CFE            ANDCC #$FE      Clear Carry
00157   00FE A7C826          STA   TEMP1,U
00158   0101 C602    WLOOP   LDB   #$02      This is the Write Mask
00159   0103 2501            BCS   BR10      If carry set, write a 0 bit el
00160   0105 5F              CLRB            This is the mask to write a 0
00161 W 0106 F7FF20  BR10    STB   $FF20     Put the bit on the line
00162   0109 ECC81D          LDD   DELAY,U   Get the delay count
00163   010C 830006          SUBD  #$06      Subtract overhead
00164   010F 830001  BR56    SUBD  #01       This is the timing loop
00165   0112 26FB            BNE   BR56      End of Time?
00166   0114 64C826          LSR   TEMP1,U   Shift the output character to
00167   0117 6A61            DEC   1,S       lower the bit count
00168   0119 26E6            BNE   WLOOP     done with all bits?
00169   011B C602    CONTIN  LDB   #$02
00170 W 011D F7FF20          STB   $FF20     put stop bit(s) on line
00171   0120 A6C826          LDA   TEMP1,U
00172 W 0123 F6FF20          LDB   $FF20     Clear interrupts
00173   0126 3585            PULS  CC,B,PC
```

## And An Assembler Question

We got a real nice letter from Tim Harris in Ames, Iowa, with some questions about assembly language programming. In fact, he sent a real puzzler. I scratched my head for awhile and then the problem hit me like a sledge hammer.

Tim works at the ISU Computation Center and has experience with MS-DOS and UNIX so he decided he would write some of his own file handling utilities. Since he had learned to program on the PDP-11, he wrote the program with subroutines. Unfortunately, he kept getting an ERROR 10 message when he attempted to run his program. The problem is compounded by the fact that in the OS-9 manual there is no Error 10. This number is reserved for BASIC09 and other high level languages. He wrote the program without the subroutines and it worked. See if you can spot the problem.

Calling routine:

```
LSTENT  stx PRMPTR,u    save param pointer
        bsr OpenPth     open the file path
        tst ERROR,u     check error flag
        bne LST30       branch on error
        . . .           else, continue
```

Now, the called routine:

```
OpenPth  ldx PRMPTR,u   get start of param
         lda #READ.     set read access
         os9 I$Open     open path
         bcs Oppth10    branch on error
         sta PATHNO,u   store path number
         stx PRMPTR,u   save updated para-
                        meter pointer
Oppth10  stb ERROR,u    store error status
         rts            return
```

Here's the solution. OS-9 detects an error condition by checking the carry bit, i.e., the bcs instruction. Tim does this also. But, he stores the B-register in a variable called ERROR. When he returns from the routine he checks the ERROR variable to see if it is zero.

Several problems could occur here. It may, or may not be, zero when the program is run. Also the B-register would not be changed by the I$Open call unless an error happens, in which case it would be loaded with the proper error number. In this code the B-register must contain 10 at the time of the call.

Tim could solve this problem by setting the variable ERROR equal to zero if the path to the file is opened successfully.

## Closing Notes

That's about all we have room for this time. In closing, we would like to give special thanks to G.J. Lipovski at the University of Texas who sent us a disk which contained a patched version of

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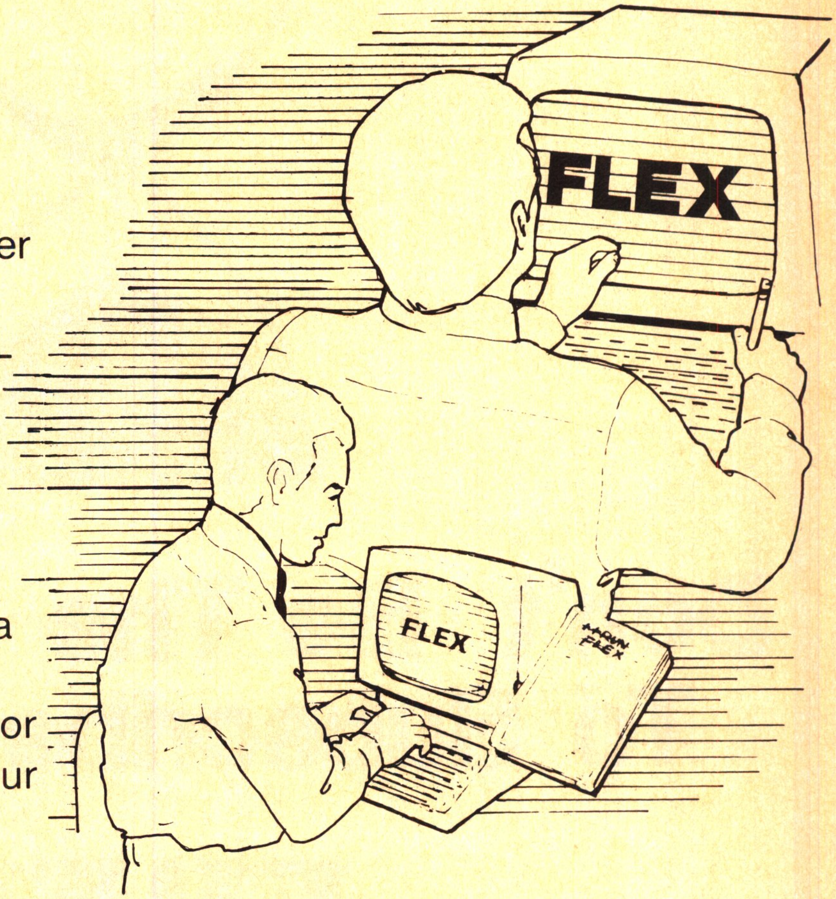

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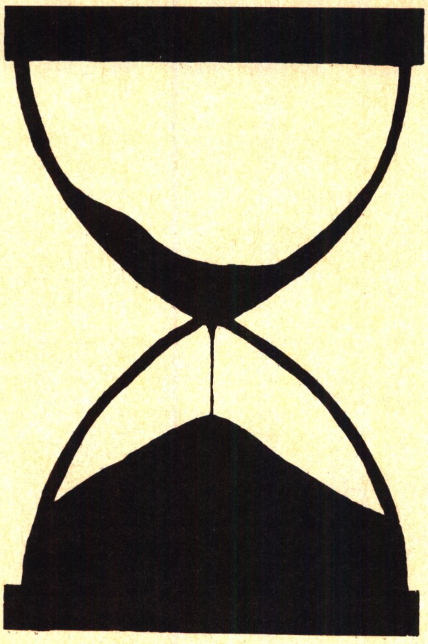

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```

  0128 3402      BDLOOP  PSHS  A
  012A A6A835            LDA   $35,Y      Get the baud rate code
  012D 8108              CMPA  #$8        Is the code too high?
  012F 240D              BHS   BR7        If so, set up the error
  0131 48                ASLA             Multiply by two
  0132 308D000F          LEAX  DAT1,PCR   Get top of table
  0136 EC86              LDD   A,X        Get the timing delay
  0138 EDC81D            STD   DELAY,U    Prepare to count down
  013B 5F                CLRB             Clear CARRY
  013C 3582              PULS  A,PC

  013E C6CB      BR7     LDB   #$CB       Get Error Code
  0140 3502              PULS  A
  0142 1A01      BR1     ORCC  #$01       Set Carry
  0144 39                RTS

  0145 04CC      DAT1    FDB   B110       Baud rate table
  0147 01C0              FDB   B300
  0149 00DF              FDB   B600
  014B 006F              FDB   B1200
  014D 0037              FDB   B2400
  014F 001B              FDB   B4800
  0151 000E              FDB   B9600
  0153 0007              FDB   B19200

  0155 8101      GETSTA  CMPA  #$01
  0157 2602              BNE   BR12
  0159 5F        BR13    CLRB
  015A 39                RTS

  015B 8106      BR12    CMPA  #$06
  015D 27FA              BEQ   BR13
  015F 53        SETSTA  COMB
  0160 C6D0              LDB   #$D0
  0162 39                RTS

  0163 3402      TERM    PSHS  A
  0165 8634              LDA   #$34       Prepare to get rid of the inte
W 0167 B7FF21            STA   $FF21      Turn off device
  016A CC0030            LDD   #$0030
W 016D FD0127            STD   $127       Put the original vector back i
  0170 3582              PULS  A,PC

  0172 C635      WAKEUP  LDB   #$35
W 0174 F7FF21            STB   $FF21      Enable input INTs
W 0177 F6FF20            LDB   $FF20      Clear INT flags
  017A C601              LDB   #S$WAKE    Wakeup Signal
  017C A645              LDA   V.WAKE,U   Owner waiting?
  017E 2705      WAKE10  BEQ   WAKE90     No, return
  0180 6F45              CLR   V.WAKE,U   Make sure it is ready for next
  0182 103F08    SENDSIG OS9   F$SEND     Wake up the process
  0185 5F        WAKE90  CLRB             Clear CARRY
  0186 39                RTS

  0187 1CEF      SRIRQ0  ANDCC #%11101111 Enable IRQ only
  0189 A14B              CMPA  V.INTR,U   Is the character a keyboard in
  018B 275A              BEQ   INABRT     Yes
  018D A14C              CMPA  V.QUIT,U   Keyboard abort?
```

The RAINBOW

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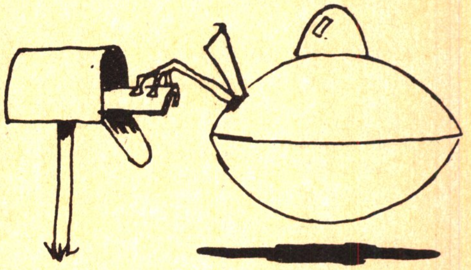

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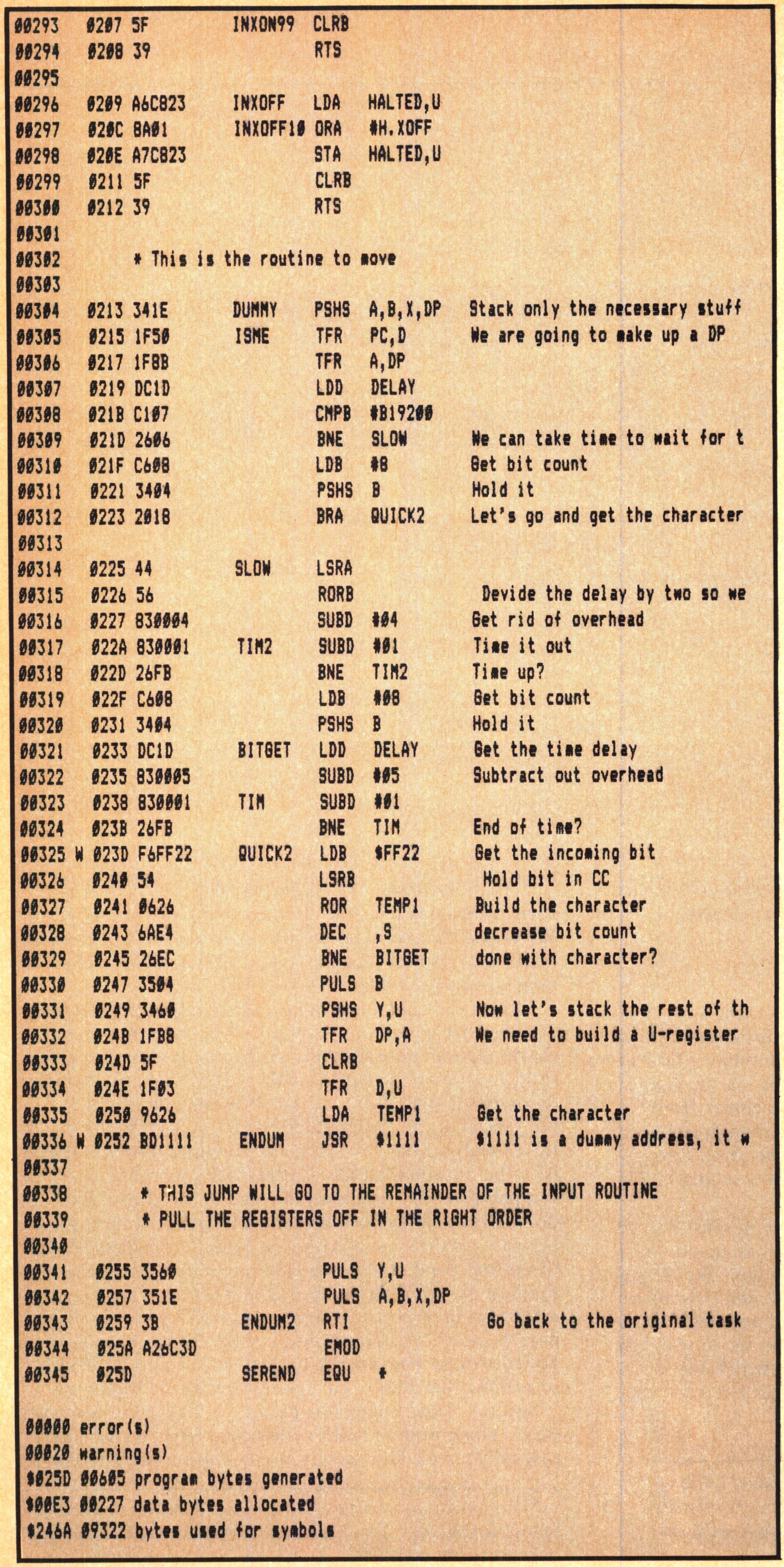
```
  018F 275A                   BEQ   INQUIT     Yes
  0191 A14D                   CMPA  V.PCHR,U   Keyboard PAUSE?
  0193 274A                   BEQ   INPAUS     Yes
  0195 A14F                   CMPA  V.XON,U    XON received?
  0197 275F                   BEQ   INXON      Yes
  0199 A1C810                 CMPA  V.XOFF,U   XOFF Received?
  019C 276B                   BEQ   INXOFF     Yes
  019E 30C874       SRIRQ1    LEAX  INPBUF,U   Get input buffer pointer
  01A1 E6C81F                 LDB   INXTI,U    Get input pointer
  01A4 3A                     ABX              Set X to the input pointer
  01A5 A784                   STA   ,X         Put character in buffer
  01A7 5C                     INCB             Advance input pointer
  01A8 C18B                   CMPB  #INPSIZ-1  End of circular buffer
  01AA 2301                   BLS   SRIRQ2     No
  01AC 5F                     CLRB             Reset Pointer
  01AD E1C820       SRIRQ2    CMPB  INXTO,U    Input Overrun?
  01B0 2608                   BNE   SRIRQ3     No
  01B2 C620                   LDB   #OVERUN    Get the Error Code
  01B4 EA4E                   ORB   V.ERR,U    Put it with the others
  01B6 E74E                   STB   V.ERR,U
  01B8 20B8                   BRA   WAKEUP     Throw away the character

  01BA E7C81F       SRIRQ3    STB   INXTI,U    Yodate Input Pointer
  01BD 6CC821                 INC   INCNT,U    Advance the character count
  01C0 A6C810       SRIRQ4    LDA   V.XOFF,U   Get XOFF character
W 01C3 1027FFAB               LBEQ  WAKEUP     This is for descripter disabli
  01C7 E6C821                 LDB   INCNT,U    Get input count
  01CA C182                   CMPB  #INPSIZ-10 is end of buffer close?
W 01CC 1025FFA2               LBLO  WAKEUP     No, continue on
  01D0 E6C822                 LDB   INHALT,U   Has X-OFF been sent?
W 01D3 1026FF9B               LBNE  WAKEUP     Yes, don't send it agaib
  01D7 8A80                   ORA   #SIGN
  01D9 A7C822                 STA   INHALT,U   Flag input halt
W 01DC 16FF93                 LBRA  WAKEUP

  01DF AE49         INPAUS    LDX   V.DEV2,U
  01E1 20BB                   BRA   SRIRQ1

        * Rest of this routine does nothing
        * Sort of dummy routine.

  01E3 A708                   STA   V.PAUS,X
  01E5 20B7                   BRA   SRIRQ1

  01E7 C603         INABRT    LDB   #S$INTRPT
  01E9 2002                   BRA   INQUIT10

  01EB C602         INQUIT    LDB   #S$ABORT
  01ED 3402         INQUIT10  PSHS  A
  01EF A643                   LDA   V.LPRC,U
W 01F1 17FF8A                 LBSR  WAKE10
  01F4 3502                   PULS  A
  01F6 20A6                   BRA   SRIRQ1

  01F8 A6C823       INXON     LDA   HALTED,U
  01FB 84FE                   ANDA  #^H.XOFF
  01FD A7C823                 STA   HALTED,U
  0200 2605                   BNE   INXON99
  0202 8635                   LDA   #$35
W 0204 B7FF21                 STA   $FF21
```



```
00293    0207 5F          INXON99  CLRB
00294    0208 39                   RTS
00295
00296    0209 A6C823      INXOFF   LDA   HALTED,U
00297    020C BA01        INXOFF10 ORA   #H.XOFF
00298    020E A7C823               STA   HALTED,U
00299    0211 5F                   CLRB
00300    0212 39                   RTS
00301
00302         * This is the routine to move
00303
00304    0213 341E        DUMMY    PSHS  A,B,X,DP   Stack only the necessary stuff
00305    0215 1F50        ISME     TFR   PC,D       We are going to make up a DP
00306    0217 1F8B                 TFR   A,DP
00307    0219 DC1D                 LDD   DELAY
00308    021B C107                 CMPB  #B19200
00309    021D 2606                 BNE   SLOW       We can take time to wait for t
00310    021F C608                 LDB   #8         Get bit count
00311    0221 3404                 PSHS  B          Hold it
00312    0223 2018                 BRA   QUICK2     Let's go and get the character
00313
00314    0225 44          SLOW     LSRA
00315    0226 56                   RORB              Devide the delay by two so we
00316    0227 830004               SUBD  #04        Get rid of overhead
00317    022A 830001      TIM2     SUBD  #01        Time it out
00318    022D 26FB                 BNE   TIM2       Time up?
00319    022F C608                 LDB   #08        Get bit count
00320    0231 3404                 PSHS  B          Hold it
00321    0233 DC1D        BITGET   LDD   DELAY      Get the time delay
00322    0235 830005               SUBD  #05        Subtract out overhead
00323    0238 830001      TIM      SUBD  #01
00324    023B 26FB                 BNE   TIM        End of time?
00325 W  023D F6FF22      QUICK2   LDB   $FF22      Get the incoming bit
00326    0240 54                   LSRB              Hold bit in CC
00327    0241 0626                 ROR   TEMP1      Build the character
00328    0243 6AE4                 DEC   ,S         decrease bit count
00329    0245 26EC                 BNE   BITGET     done with character?
00330    0247 3504                 PULS  B
00331    0249 3460                 PSHS  Y,U        Now let's stack the rest of th
00332    024B 1FB8                 TFR   DP,A       We need to build a U-register
00333    024D 5F                   CLRB
00334    024E 1F03                 TFR   D,U
00335    0250 9626                 LDA   TEMP1      Get the character
00336 W  0252 BD1111      ENDUM    JSR   $1111      $1111 is a dummy address, it w
00337
00338         * THIS JUMP WILL GO TO THE REMAINDER OF THE INPUT ROUTINE
00339         * PULL THE REGISTERS OFF IN THE RIGHT ORDER
00340
00341    0255 3560                 PULS  Y,U
00342    0257 351E                 PULS  A,B,X,DP
00343    0259 3B          ENDUM2   RTI                Go back to the original task
00344    025A A26C3D               EMOD
00345    025D             SEREND   EQU   *

00000 error(s)
00020 warning(s)
$025D 00605 program bytes generated
$00E3 00227 data bytes allocated
$246A 09322 bytes used for symbols
```

*CCDISK* and a nice disassembler program named *DIS* as well as the descriptions of several student projects, most developed around CoCo OS-9. A hard disk system and voice synthesis were included. We'll try to highlight it soon. We'll also try to pick up that promised look at the UNIX-like utilities from D.P. Johnson.

# OS-9 Users Group President's Column

**By Dale L. Puckett**

### Who Are We And What Are We Doing For You?

We are a Des Moines, Iowa based corporation formed to promote the use of computers in general and Microware's OS-9 operating system in particular. This year's officers were elected at the Second Annual Microware OS-9 seminar during August 1983. They were given a mandate to incorporate the group, establish a method of communication and set up a software exchange. Progress is being made in all areas. However, to mimic an old saying, four officers do not a dynamic group make.

### What Can You Do For Us?

You, the OS-9 user, are the lifeblood of the group. If you take an active part in the organization by contributing programs to the software exchange, articles for the newsletter and technical help for the newcomers, we will someday be a viable force in the industry. If you do nothing, you will get nothing in return. It's up to you.

We need engineers and systems programmers to help George get the bulletin board system on line. We need recruiters and personnel types to help Peter increase the membership. We need people to help Dave Gibson put out the newsletter. We need people to manage the software library. We need others to write articles and stir up publicity. And we need people to coordinate the exchange of information between the many local OS-9 users groups we hope to inspire.

### Why Should We Care?

The 6809 microprocessor — the best on the market — has run behind all others in the personal computing field since the beginning because there has been no coordination and cooperation. With the increase in the number of users made possible by Tandy's Color Computer version of OS-9, we again have a chance to become a viable force in the marketplace.

Please, say you want to help. Send us a letter and tell us what you would like to do. We'll put you in touch with the proper committee chairman immediately. And remember, if you solve a problem or create something you're proud of, send it to us for publication in *MOTD* and leave a note on the CompuServe OS-9 SIG.

### Membership News

Your membership will be good through January 1, 1985. Renewals at or after the Third Annual OS-9 Seminar in August 1984, will be good from then through December 31, 1985. All members, regardless of when they join, will receive all services of the Users Group provided since August 1983. Additionally, all OS-9 Users Group members will have access to the special CompuServe XA-4 database which contains our complete software exchange library.

We hope you'll join us.

## hogg_wash

# On OS-9 Matters, Frank FLEXes His Bias

By Frank Hogg
*Rainbow* Contributing Editor

*NOTICE: The following is a very strong opinion that may upset certain people. Parental discretion is advised.*

**/d0/os9 vs +++FLEX**

We have been getting three to five calls a day and perhaps as many letters from customers wanting to know whether they should purchase OS-9 or FLEX. I have been keeping a low profile on the subject because OS-9 is from Tandy and FLEX comes from us. However, with all these calls coming in, perhaps it is time to give my biased opinion about the two operating systems. Keep in mind that I have a vested interest in selling FLEX when you read the following.

What is wrong with OS-9? Nothing really. It's just that on the CoCo it leaves a lot to be desired. What exactly do I mean by this? After all, I use OS-9 every day. We have a terminal on each person's desk in the office and they all use OS-9. So why would I say anything bad about OS-9? I *like* OS-9! I think it is a fine operating system. Of course, I'm using it on a $15,000+ Gimix III computer with I/O processors and other fancy stuff. Not a CoCo! I guess it is a matter of matching the tool to the job.

A $15,000 Gimix* OS-9 Level II is the perfect tool: multi-user, multi-tasking, able to work with one megabyte of RAM and 20 megabytes or more of hard disk — the system really flies. However, on a CoCo, I think OS-9 is close to useless and this is why.

First, Tandy did not do a pure OS-9. Close, but not pure. The disk driver will only support single-sided drives and at the maximum, only 40 track. To put BASIC09 on the system disk, you have to delete files, otherwise it won't fit. A single-drive user is plumb out of luck. You can't change the stepping speed of the drives either. So, if you have better drives than Tandy's, you will not be able to utilize the extra speed. Now, before you write nasty letters to me, let me say that you can patch OS-9 to get around some of the above. But, my point is that Tandy does not support that and it should have been part of the system in the first place. The end result of all this is that the disk drives do not have enough room left on them to do anything really useful. There is a replacement driver available from DP Johnson for $29.95 that will support the above shortcomings. I think Tandy should have designed it so you do not have to spend another $30 for something that should have been there in the beginning.

Second, Tandy does not provide a Hi-Res screen with OS-9. You are left to work with the pathetic 16 x 32, uppercase only screen. Of course, you can buy our O-Pak for $35.

*(Frank Hogg is the president of Frank Hogg Laboratory, one of the world's largest suppliers of software for 6809 based computers. He and his wife, Linda, live in Syracuse, New York.)*

---

*Our system includes the Gimix III, 320K RAM 20 megabytes hard disk, 7 TV925s and 3 printers. The Gimix itself only costs about $9,000.

And it is a good buy. But you shouldn't have to. It should have been part of the package.

Third, multi-user and multi-tasking on the CoCo is possible, but it is useless. The serial port can only be run at 300 Baud and even then you can lose characters. Besides, what use is multi-user at 300 Baud? Multi-tasking is great fun on the CoCo, but it is also useless. During disk access the keyboard is not scanned and you have to type slow and deliberate in order not to lose characters. All this gives you is a taste of what it would be like. A lot of promise but no action.

Fourth, there is not enough memory to do anything useful. In order to make OS-9 useful, you have to have O-Pak's Hi-Res screen. With that in memory, there is only 32K left. You would have been better off to stay with RS DOS and saved a lot of money. We have been struggling to squeeze our programs into this restricted work space and it is not easy to get sophisticated programs into a small amount of memory. Many will not fit. These include the very fine *DynaCalc*, which is just too big to fit into 32K. Too bad, it is probably the finest spread sheet program available.

Fifth, the printer port only runs at 2400 Baud. There is no reason for this. We run the darn thing at 9600 Baud in FLEX with no sweat.

Sixth, OS-9 is *not* user-friendly. User-friendly means that a program is easy to learn and use. OS-9 takes a dedicated person many weeks to learn. But once you learn it, you will like it. However, if you don't have two or more weeks to devote to it, then perhaps you ought to reconsider. For instance, to do a simple thing like copying all the files from one disk to another in FLEX, you would type: "COPY 0 1". In OS-9 this is what you would type, presuming that you had already changed the data directory to point to the disk in /d0. Type "save -is24 /d0 /dl ! shell". This is *not* user-friendly!

Seventh, you need two disks to boot OS-9. FLEX is only one.

Finally, let me sum up by saying that I believe that our FLEX is a better tool for the job than RS OS-9. All that you need to run OS-9 costs a total of $135. With FLEX, you get everyting for $70. Also with FLEX, it is already on the disk, ready to run. With OS-9, you have to order from three different places and do the installation yourself. FLEX has been around for the CoCo for over two years and it is easy to run and use. It is easier to write software for FLEX and there is more software available. You can use your CoCo with the right software to run a business or do sophisticated word processing or program development. All you can do with CoCo OS-9 is get a taste of what it would be like to have the real thing.

I like OS-9 a lot, but not on the CoCo. I like it on a Gimix with seven users and lots of memory and fancy hardware. That is where it fits better. OS-9 on the CoCo is like trying to fit 10 pounds of things in a one- pound bag. It is not the best tool for the job. FLEX is the best operating system for the CoCo.

Postscript: Before you write saying that I should not get on a soapbox talking about a product I sell, keep two things in mind. First, many, many people have asked for my opinion on this matter, and second, I never say anything I don't believe.

## Interview with Chuck Eaker

Chuck Eaker is the author of *X-FORTH* and *CC-FORTH*. Both packages were taken off the market until this new package *E-FORTH* was ready. I wanted to send a letter to users of *X-* and *CC-FORTH* telling them about the new *E-FORTH*. In order to get the information from Chuck, I played devil's advocate, while Margaret Hart (who is Jeri Colella's new assistant) took notes. It worked out so well that I thought you would like to see the results of the interview.

### Evesdropping on a conversation between Chuck Eaker and Frank Hogg

### By Margaret Hart

*(As the discussion begins, Chuck is seated comfortably in a recliner in Frank's office, smoking a cigarette. Frank, on the other hand, in his eagerness to learn everything there is to know about the new E-FORTH, is perched on the edge of his couch fidgeting, as their conversation begins.)*

**Frank:** Why is the 83 Standard better? I've got *X-FORTH*. What's the difference? Why should I buy *E-FORTH*?

**Chuck:** It is different. It's different in that the words that are available in the glossary are 83 Standard words. This means that if you pick up FORTH Dimensions and you see a program that you like, you can probably enter it without any changes and it will run. Similarly, if you pick up Brody's book and try some of the examples in it, they'll run. This is not the case with *X-FORTH* or *CC-FORTH*.

**Frank:** Were there things you changed about the core?

**Chuck:** Well, it's smaller and, in some cases, it's faster.

**Frank:** Does it have the Assembler built into the core?

**Chuck:** The Assembler is built into the nucleus. The Assembler vocabulary has changed. It now conforms to the "Motorola Green Card."

**Frank:** It matches the Motorola Mnemonics?

**Chuck:** Yes.

**Frank** In the past we had two distinct versions. A core for *X-FORTH* and a core for *CC-FORTH*.

**Chuck:** Right.

**Frank:** ·Now we have a generic core?

**Chuck:** Yes, that runs on the Color Computer or under FLEX and, hopefuly, under other systems too.

**Frank:** So, that gives you a more transportable version. What other things? What am I going to gain from using *E-FORTH*?

**Chuck:** Well, it has the Editor that Brody describes.

**Frank:** Does it follow the Brody *Getting Started With* FORTH book?

**Chuck:** It follows Brody with a few exceptions. Those are listed in the appendix. And none of those exceptions, as far as I know, make any difference using his examples. You can still use all of his examples as is, without change.

**Frank:** So, as a learning tool, it's much better than the other implementations?

**Chuck:** Yes, much better. All I/O is vectored so that you can rewrite I/O returns.

**Frank:** It would make it more suitable to be in ROM?

**Chuck:** It's ROMable.

**Frank:** It's ROMable now. But, could you modify it to patch into a target machine more readily than before?

**Chuck:** Yes. In fact, the core itself is assembled separately. You just patch in all the I/O and you can do it at the assembly level or at the FORTH level. *E-FORTH* believes that it owns the disk.

**Frank:** Does it use a Standard FORTH disk format?

**Chuck:** Yes it does.

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*Now a lively party game where two teams compete against the clock to name several items in a category. Includes 60 rounds with color graphics and sound. Machine language routine for fast response. (Game Show was reviewed in the Jan. 1983 issue of Rainbow). Requires 16K extended basic and joysticks.*

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**Frank:** Although it still reads and writes FLEX disk, but, indirectly?

**Chuck:** It comes with DOS in the FLEX version, which allows you to pass a string to FLEX to execute.

**Frank:** How can you transfer information between *X-FORTH* and *E-FORTH*?

**Chuck:** You can't. However, the add-on for the FLEX version would add this capability.

**Frank:** Would that be an option?

**Chuck:** Yes. And the way that works is, you can transfer *X-FORTH* files over directly (16 lines by 63 characters) and two, the other version allows you to get the Standard 64 characters by 16, by doing a lot of calculating as to where the sector is. It will also include information on how to install another I/O device (you can define the class of I/O devices a little like OS-9) like ACIA's and PIA's, then you can create named devices of that type.

**Frank:** So this would be similar to an I/O package that would also support other systems?

**Chuck:** Yes, I've written a few FLEX utilities in FORTH, like *List*, to give samples of how this can be done in FORTH.

**Frank:** This sounds like a very nice, interesting package. What are the other options that will be available?

**Chuck:** For the Color Computer, a screen editor (standard FORTH has the Brody line editor) which is a powerful editor, and one of the reasons why I have never been tempted to do a screen editor.

**Frank:** Does the Color Computer come with a Hi-Res screen?

**Chuck:** Yes.

**Frank:** 51 x 24?

**Chuck:** Yes. User-definable keyboard, that's the non-alphabetic keys. The special keys are definable.

**Frank:** Do you have the turtle graphics option?

**Chuck:** That, and the Four Part Harmony option.

**Frank:** Are those going to be complete with Source?

**Chuck:** The documentation will also be included and significant. The manuals are tutorials giving a thorough explanation on what's being done and why. All that is needed to run this program is a Color Computer.

My basic idea here was to come up with a bare bones package that you needed to be able to use Brody, to learn FORTH, and to use examples that are published in FORTH Dimensions, Doctor Dodd's, etc. And then all the other features that have been included in *X-FORTH* and *CC-FORTH* would be additional add-ons.

So, what I have planned is an add-on specifically for the FLEX version, which would show how to change the input/output routines and how to add new input/output devices, such as printers and video boards. Another optional package for either version, which would work with the Color Computer, would be a turtle graphics package.

Another add-on would be what I'm calling a Four Part Harmony package. This would allow chord sequences to be written. With that, you would take the disk out, load it, and then it would run immediately on the Color Computer. For FLEX users who use Gimix or SS50 machines, it will include a diagram of how you can wire up a PIA to get the sound.

And finally, definitions are provided in source so that the user can change them.

### +++Redefine Keys For FLEX

The following will let you change what key(s) are used for control keys in FHL FLEX.

**FLEX Patches For Alternate Control Keys**

#1 Make the down arrow key the control key and [SHIFT]-[down arrow] becomes "super-shift."

#2 Make the [CLEAR] key the control key and [SHIFT]-[CLEAR] the "supershift" key.

| | #1 | #2 |
|---|---|---|
| C7F6 | | = 7D |
| C7DA | = 7D | |
| C808 | = 03 | = 03 |
| C80D | | = 40 |
| C810 | = 2E | = 2B |
| C812 | = 06 | = 06 |
| C816 | = 7C | = 7C |
| C817 | = C7 | = C7 |
| C818 | = FC | = FC |
| C819 | = 35 | = 35 |
| C81A | = 82 | = 82 |

Make the above patches with the MON or SETUP commands. Remember that with SETUP you can create a .BIN file that you can append to FLEX for a permanent change. See the part on SETUP that refers to creating files (F) and also see the beginning of the FLEX manual regarding customizing FLEX.

**d0/sage_news**

I recently spoke to MPD in England about SAGE for Level I OS-9. They are working on it and expect to have it operating within a few months. No information about price as yet. This program will put the CoCo on the map as far as application software is concerned. See February's column about SAGE.

---

*Hint . . .*

# Putting On The Brakes

When using the *STOP* command to debug your program, ask for the information you want before you request the *STOP* action. For instance:

```
10 INPUT"NUMBER",A
20 IF A=3 THEN Y=10:X=30
30 IF A=4 THEN Y=20:X=40
40 PRINT X;Y:STOP
```

Line 40 shows the format that I use. It saves typing in the print request after the *STOP* command functions. A little thing, but it has saved me many finger strokes.

I submit this in order to repay the help and enjoyment that your fine magazine has afforded me as I try to learn about my CoCo.

**George B. Sullivan**
**New Carrollton, Md.**

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Static **RAM** and double-density **DMA** floppy disk controllers are used exclusively in all systems.

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Systems are assembled using burned-in and tested boards, and all disk drives are tested and aligned by **GIMIX**.

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**GIMIX** lets you choose from a wide variety of options to customize your system to your needs.

## SOFTWARE

All **OS-9/FLEX** systems allow you to software select either operating system.

Also included is the **GMXBUG** monitor and, in systems with 128K or more of RAM, **GMX-VDISK** for **FLEX**.

All **GIMIX OS-9** systems include **Microware's Editor, Assembler, Debugger, Basic09,** and **Runb**; and the GMX versions of **RMS** and **DO** for **OS-9**.

All **GIMIX** versions of **OS-9** can read and write RS color computer format OS-9 disks, as well as the Microware/GIMIX standard format.

New and exclusive with **OS-9 GMX III** systems is the **GMX OS-9 Support ROM**, a monitor for **OS-9** that includes memory diagnostics and allows the system to boot directly from either hard disk or floppy.

A wide variety of languages and other software is available for use with either **OS-9** or **FLEX**.

## OS-9 GMX III/FLEX SYSTEMS (#79)

The **#79** super system now includes (in addition to the above): the **GMX 6809 CPU III**, a **256K CMOS Static RAM Board (#72)**, and a **3-port Intelligent Serial I/O Processor (#11)**.

The **GMX 6809 CPU III** can perform high-speed DMA transfers from memory to memory and uses memory attributes and illegal instruction trapping to protect the system and users from program crashes. If a user program crashes, only that user is affected; other users are unaware of the problem.

The 3-Port Intelligent Serial I/O Board (#11) significantly reduces system overhead by handling routine I/O functions; freeing the host CPU for running user programs. This improves overall system performance and allows user terminals to be run at up to 19.2K baud.

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## OS-9 GMX I / FLEX SYSTEMS #49

The **#49** systems include 64KB static RAM, #05 CPU, #43 2 port serial board.

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|---|---|
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| with **#88** dual 8'' DSDD drive system | **$5698.49** |
| with **#90** 19MB Winchester subsystem and one 80 track | **$6898.49** |

## OS-9 GMX II / FLEX SYSTEMS #39

The **#39** systems include 128KB static RAM, #05 CPU, #43 2 port serial board.

| | |
|---|---|
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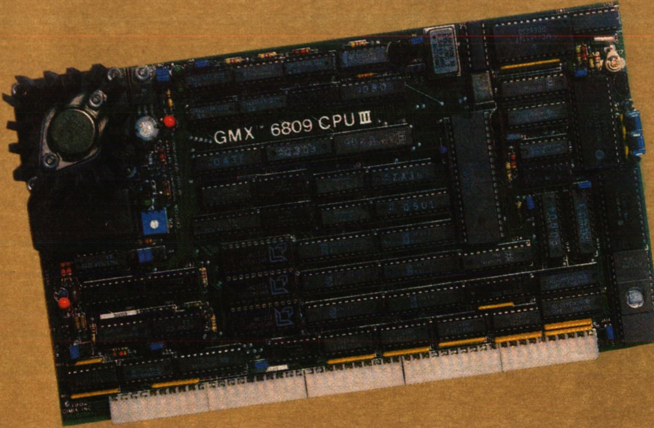

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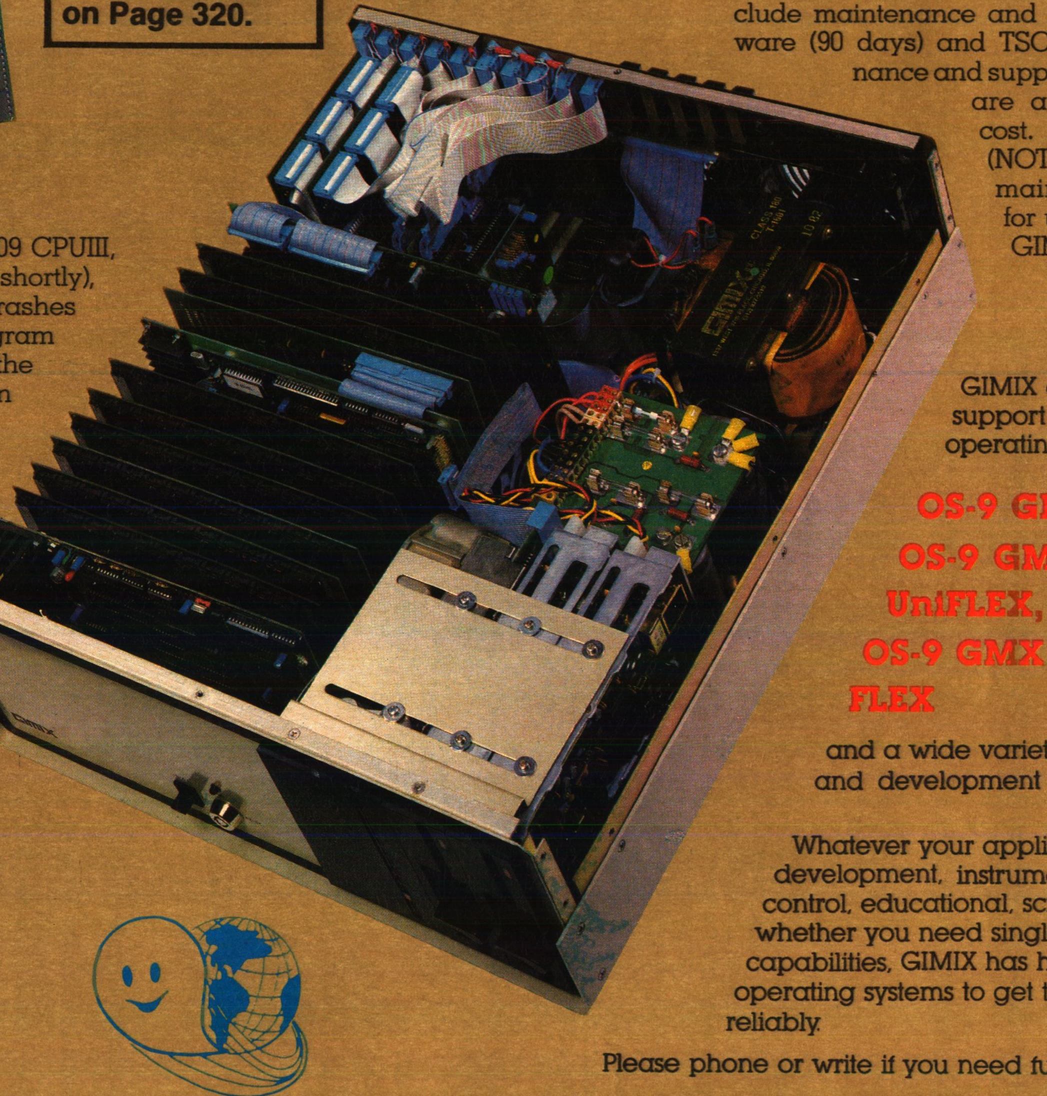

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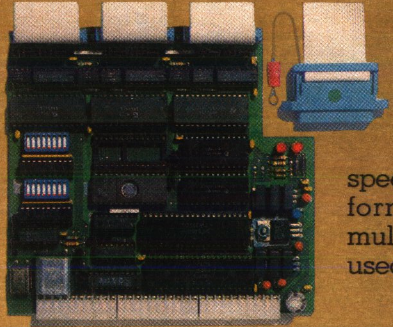

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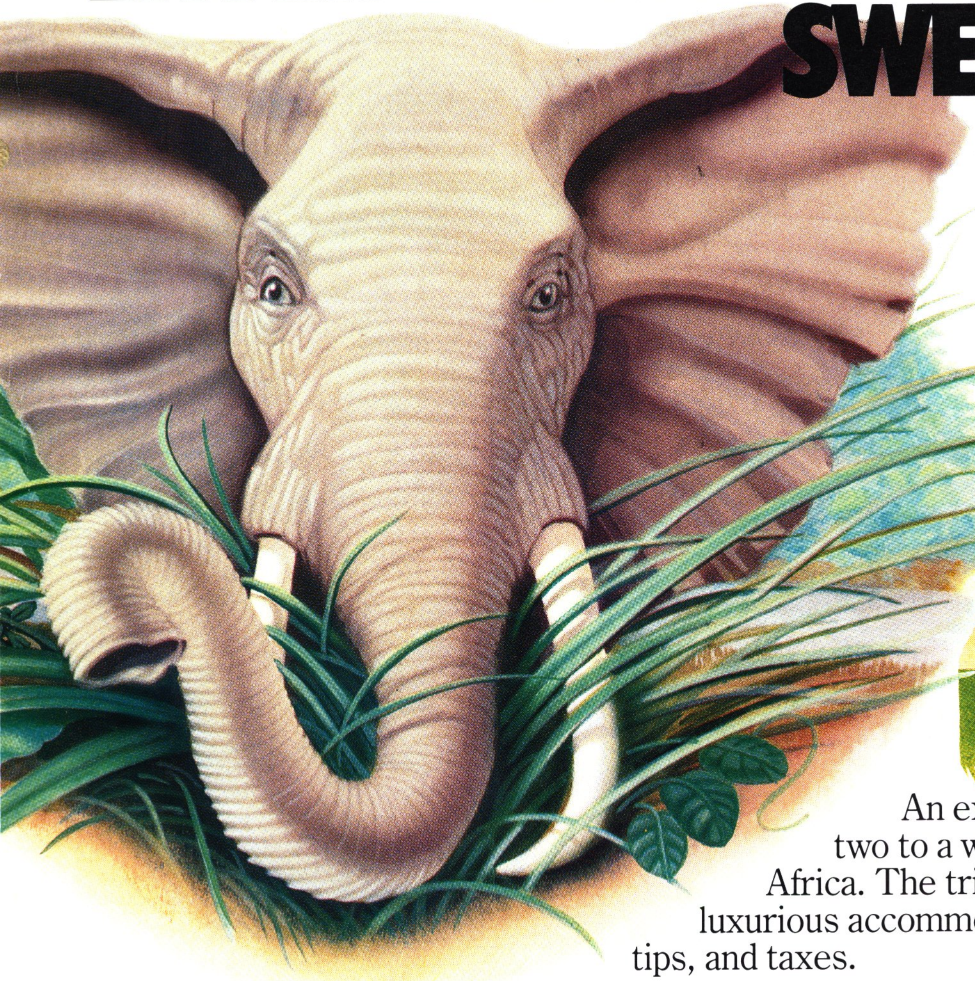

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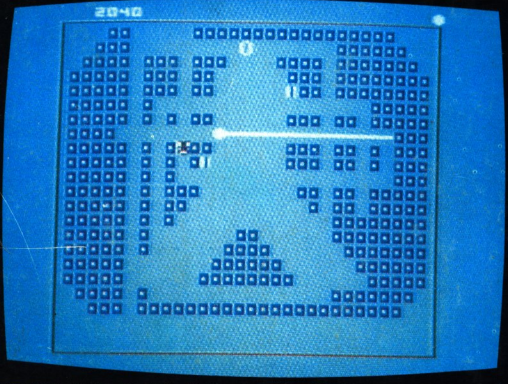

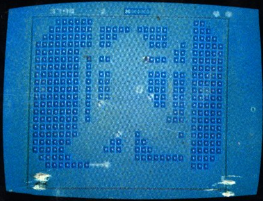

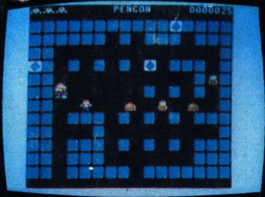
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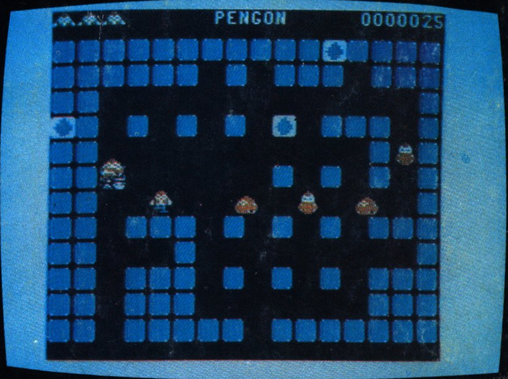
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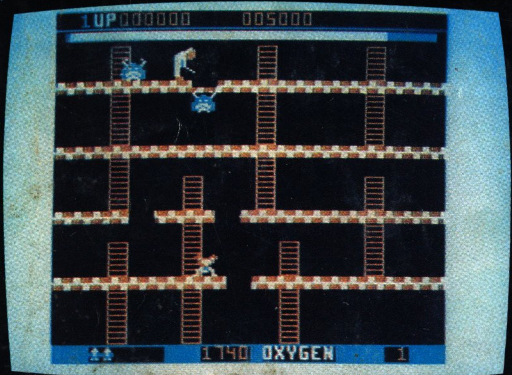
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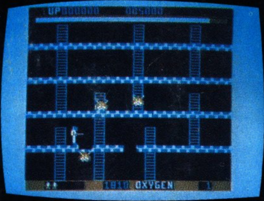

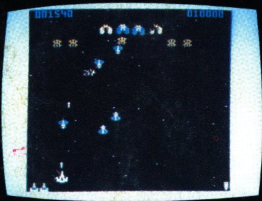

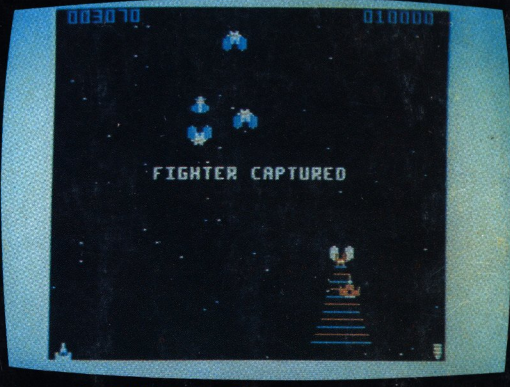
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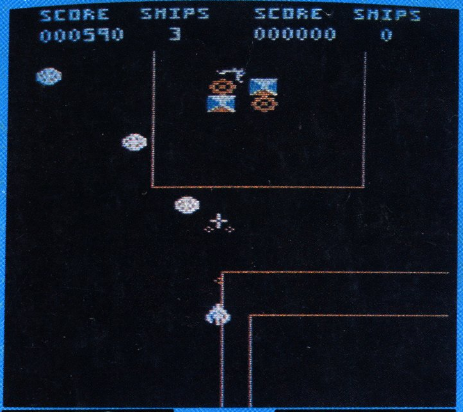
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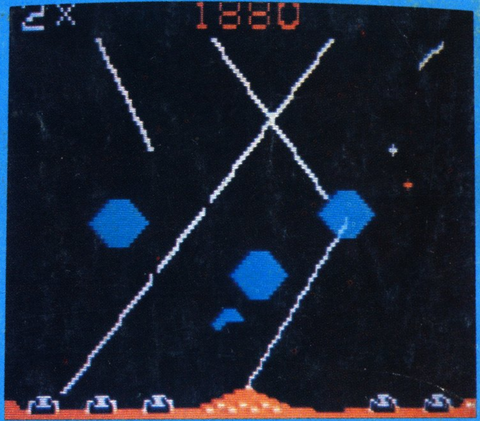

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